COMPUTERWORLD

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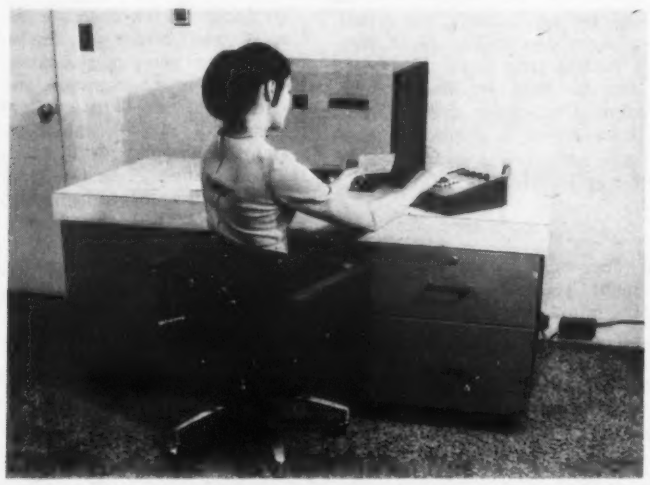

After feeding the turnaround document into the optical reader in front of her, the operator keys in the amount of the check accompanying the document. Account number and the amount of the check are stored in devices contained in the drawers.

Optical Reader's Purpose: Better Paperwork Flow

By A.B. Williams
CW Staff Writer

MADISON, Conn. – Improving the flow of turnaround documents from the time they're printed (computer output) to the point at which they're read as input is the aim of Allied Computer Systems.

The company's new products are designed to speed the flow of the most important returns (usually cash) and to reduce the number of human (error-prone, expensive, and inefficient) steps on the way to the computer.

How?

Readoc is the company's name for the key unit in the turnaround system. Opened mail is batched and passed to an operator. She puts the document through a Readoc numeric-only optical unit, which picks up the account number. She enters, from an attached 10-key unit, the amount of the check. Account number and amount paid go to paper tape (or magnetic tape or punch) located in a drawer in the unit. This is the source of computer (360) compatible input.

The amount also is fed to an adding machine in another drawer for batch control. Batch and sequence number can be recorded on the check for audit trail.

The optical unit appears to be capable of reading characters or lines that would not make it through an IBM 1428 optical reader. In demonstration, a unit read – correctly – badly smudged lines, 0s and 8s penciled over to look like each other, and other deliberately marred information. It accepted – and handled correctly – mutilated documents. Characters that Readoc can't read are displayed on a Nixie tube for operator key-in.

The company, located at 589 Boston Post Road here, is talking, realistically, of throughput rates of 300 documents/hour or better. This is slow compared to expensive optical scanners.

Pricing

Readoc is priced in an unusual fashion. While it can be rented ($600/mo) or purchased ($24,000), the basic pricing is 2 cents per document up to

(Continued on Page 4)

SDS 940 User Seeks $11 Million In Damages From Manufacturer

NEW YORK – Data Network Corp., one of the pioneer users of the SDS 940 time-sharing system, is suing Scientific Data Systems for $10 million in compensatory damages and $1 million in punitive damages.

The suit, filed in federal district court here, charges that the equipment has been "totally inoperational for repeated and protracted periods."

A spokesman for SDS in Los Angeles said the company had not been served with a copy.

Herman L. Meckler, president of Data Network, told CW, "This has been an absolutely horrible situation."

Data Network plans to stop offering service on the 940 and to switch its customers to a General Electric computer and to an IBM 360/40, a company spokesman said.

Data Network charges that the first two 940s that it acquired were defective and that service personnel were inadequate and incompentent.

The service bureau contends it has lost customers because of inadequate operation of the computers.

An SDS spokesman told reporters that SDS and Data Network had been in negotiations over outstanding obligations that Data Network has owed SDS for "some time."

SDS recently was acquired by Xerox as a subsidiary.

The SDS 940 is a medium-scale time-sharing system used by service bureaus, universities, industrial companies, and research organizations. SDS reported some time ago that users included White Weld & Co., New York; Dial-Data, Inc., Boston; Computer Sharing, Inc., Bala Cynwyd, Pa.; and Com-Share.

Massachusetts Hearings Explore Computer Usage

By Joseph Hanlon
CW Staff Writer

BOSTON – "It was hard for us to comprehend how you would spend $45,000 for a 25-page consultant's report. But when this was explained, we could see things a little better," declared George Hertz, a legislative aide to the Massachusetts Committee on Electronic Data Processing.

The new committee is holding hearings to investigate the use of computers in Massachusetts. Hertz explained that the hearings are purely informational. "We are all approaching it from a layman's point of view," he said.

Hertz stressed that currently there are no guidelines for state computer use. "I hope that when we get done, there will be standards covering the entire computer area. But we can't do that with just one set of hearings," he said. Hertz pointed particularly to federal guidelines covering purchases, and said that the committee hoped to develop "federal-type legislation on a much smaller level to meet state needs."

The first hearing looked at the state's existing computers and at the state policy toward consultants. Beryl M. Cohen, committee cochairman, noted that of the state's 27 computers, 15 are IBM, and that no other one company produced more than three of the others. Hertz explained that Cohen feels that while IBM may have produced better machines in the past, that for state purposes other vendors may now be just as good. "We want to create an atmosphere of competition among vendors," Hertz said.

Cohen also raised questions about consultants. In addition to asking questions about the expense reports, he also noted that there were no guidelines covering consultant reports.

Finally, Cohen wondered if the state's computers were being under-utilized. He noted that only three of the state's 27 computers were used on all three shifts, and that 10 were used on only one shift.

The second hearing is scheduled for Sept. 17. Three other hearings will be held during the fall.

City Runs Benchmarks

NCR Century 100 Chosen Over 3 Others

CLEARWATER, Fla. – Price was the major factor in this city's choice of an NCR Century 100. The Century 100 costs $800 per month less than other comparable machines, according to Clearwater Data Processing Manager William McCall.

Clearwater now has an IBM 360/20 card system and is expanding to disk. The city uses its computer primarily for utility billing and secondarily for police statistics, payroll, and general ledger.

For a benchmark, the city used 547 utility customers. The test included billing and accounting for gas, water, garbage, and sewerage. McCall reported that the C-100 was faster than the other systems. He also noted that he found NCR's software "a little better." But price was the major factor in the decision, he said.

Bids were submitted by four companies for a 16K machine with two disk drives and a card reader/punch. Proposed monthly rentals were:

NCR C-100: $2,460 on five-year lease, $2,800 on one-year lease

IBM 360/20: $3,402
Honeywell 120: $3,424
GE-115: $3,520.

McCall estimated that it will take three men five months of reprogramming to convert to the Century 100, compared to three months of work if they had just moved up to a 360/20 disk system. "The extra reprogramming is worth it," he said. "We will be better off in the long run."

The city hopes to have the Century 100 in operation by Jan. 1.

CW Names Special Correspondent, Opens New Office in Los Angeles

LOS ANGELES – To ensure that *Computerworld*'s news coverage keeps up with the rapid growth of the West Coast computer industry, CW has appointed a special correspondent in the area and has opened a new office here.

Phyllis Huggins, the new special correspondent, has an extensive background in the computer field. She will concentrate on in-depth coverage of the West Coast, but will go wherever the news takes her.

One of her first assignments was to prepare a series of articles on Systems Development Corp., which recently announced it would become a profit-making operation. The first part of the series appears on page 21.

Before starting a newsletter five years ago, Mrs. Huggins was public director of the American Federation of Information Processing Societies. She formerly served as public relations coordinator and applications editor for the Bendix computer division. She will continue to edit her newsletter, *Computing Newsline*.

The new office is at Brentwood Square, 11661 San Vincente Blvd., Los Angeles, Calif. 90049.

CW, which celebrated its second anniversary in June, is the largest subscription-paid publication in the computer field.

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Sweeping Aid for Users Recommended

Japanese Program Covers All Areas of Computer Field

TOKYO – Sweeping recommendations that would aid computer users have been made by a Japanese government agency.

The program covers education, software, standards, telecommunications, financial assistance, and privacy.

The report, prepared by the Information Industry Committee, Industrial Structural Council, Ministry of International Trade and Industry, pointed out that the Japanese information industry now lags behind that of Western countries.

Education

The program calls for mandatory training on basic computer usage and information processing to be given at all colleges and high schools. At least one "model college" would be established in each prefecture. College courses and advanced training would be established for the training and recruiting of systems engineers and programmers.

To help develop technology, the report calls for the establishment of a public corporation for system development, which would engage in large-scale projects of national interest and involve private industry in the development of software. The report also recommends the granting of subsidies and long-term loans.

The report calls for the development of input and output equipment and other peripheral devices and for the development of next-generation technology.

Standards

The section on standards calls for a government organizational realignment and for standardization of both input, output, and interface equipment and software used in large-scale national projects. Also recommended is a five-year program to standardize data codes, accounting books and bills, software, hardware, and unrecorded media and recording methods.

To improve the telecommunications network, the report recommends that telecommunication lines, currently monopolized by Nippon Telegraph & Telephone Corp., be made available to private industry and that transmission capability, both in quantity and quality, be increased and made available at reasonable costs.

To promote the information industry, the committee recommends that financial assistance be given and that special taxation measures be approved to encourage investments and create greater demand.

Privacy

The report also calls for the establishment of codes to protect users from unauthorized disbursement and mishandling of information.

Although private industry will eventually predominate in the information industry, the report said, the government should play a leading role when the collection of data requires a large amount of capital outlay, there is a need for government leadership, and private services would not be profitable.

Assistance

The report calls for government assistance in establishing the value of software and promoting its distribution, establishing loans and special depreciation rates for computers, and instituting Japan Development Bank loans for the purchase of computers.

To facilitate the computerization of small businesses, the report calls for planning assistance, the joint use of computers, and the development of a software package for small-business use.

The program also recommends the wider application and more advanced use of information processing within the government.

A summary of the report was prepared and released by the American Embassy here.

Codasyl Report Mailing Delayed

NEW YORK – There have been considerable delays in the distribution of a technical report, "A Survey of Generalized Data Base Management Systems," [CW, June 11] the Association for Computing Machinery said last week.

The distribution of the report, released by the Codasyl Systems Committee, was delayed because of the July closing of Waverly Press in Maryland, ACM's publication source, an ACM spokesman said.

DATA COMMUNICATION IDEAS?

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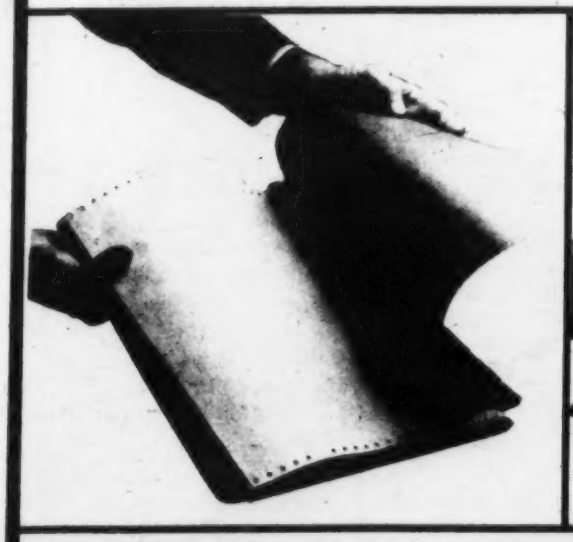

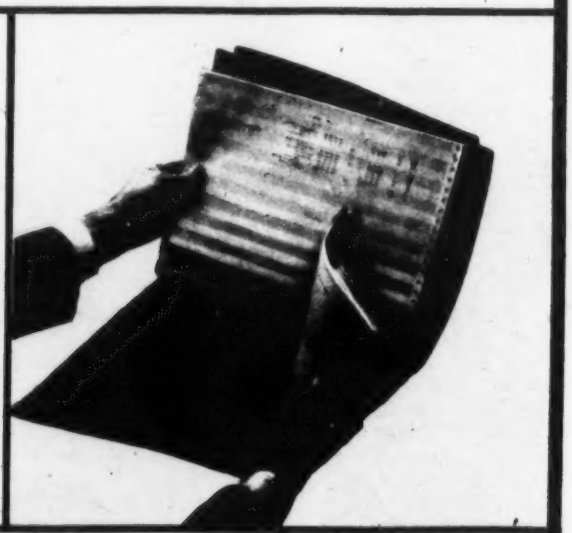

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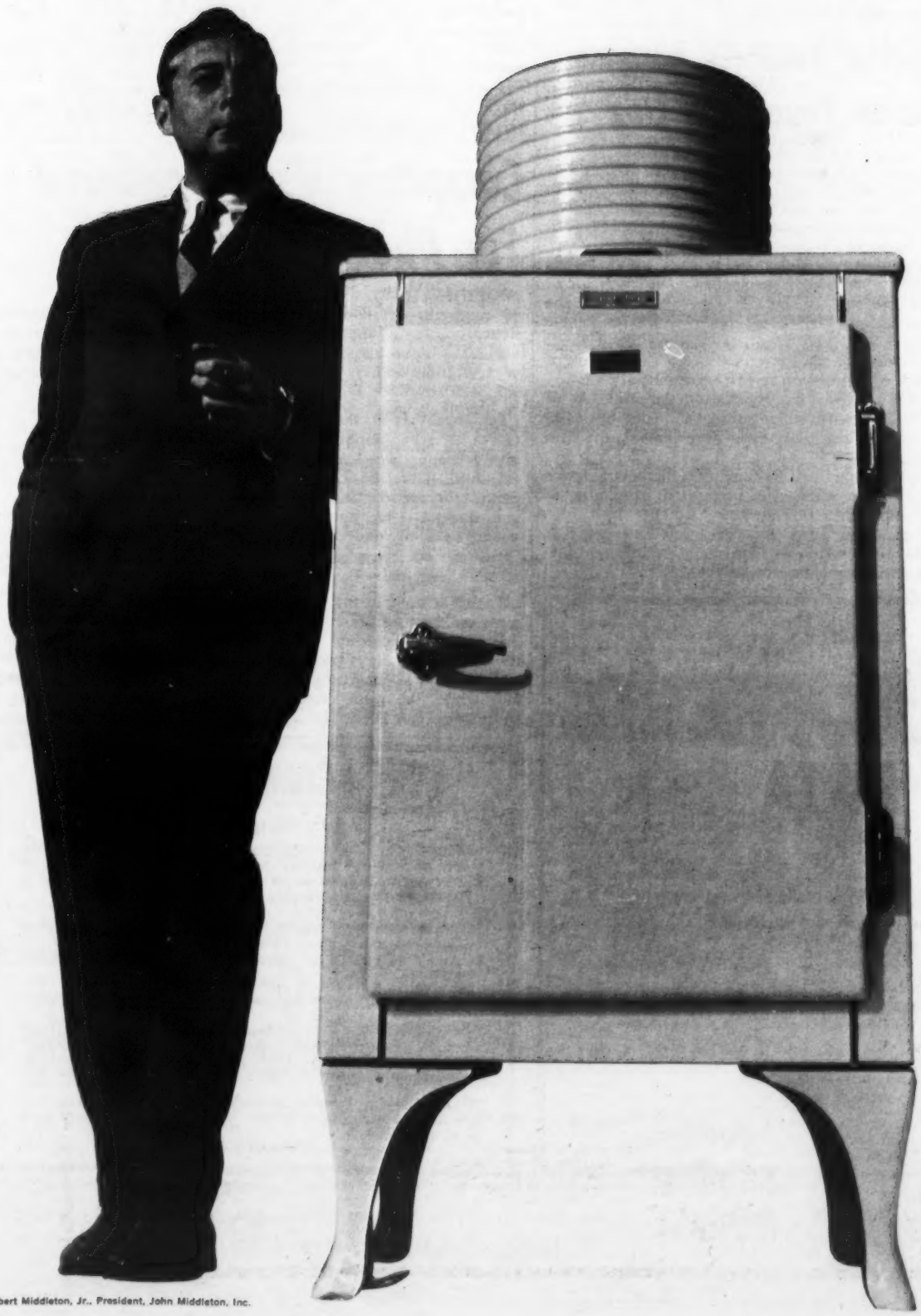
How a 36-year-old refrigerator helped John Middleton, Inc. choose a new computer



Herbert Middleton, Jr., President, John Middleton, Inc.

Remember old reliable — the General Electric monitor-top refrigerator?

Herbert Middleton, Jr., fourth generation president of Middleton Tobacco, remembers it better than most, because he still has one.

Everything else in Middleton's factory is modern, up-to-date to produce finest quality smoking tobaccos. Someone was supposed to throw the refrigerator away. But it just wouldn't quit. It's still in service today as it has been for the last 36 years.

When he needed a new computer, Mr. Middleton went for the same kind of reliability and economy he's still getting from his refrigerator. The result: a GE-55 computer.

Reliability? The GE-55 was up and running 100 percent in less than two days from time of delivery. That was last January. Since then, downtime has been next to nothing. Another service record in the making.

Economy? The GE-55 is the least expensive computer General Electric makes. But it has many capabilities of much larger, much costlier machines. Middleton recognized these values.

If you're looking for a computer, any size computer, call your nearest GE Information Systems Office. Or write Section 290-53 B, General Electric, 1 River Road, Schenectady, N.Y. 12305.

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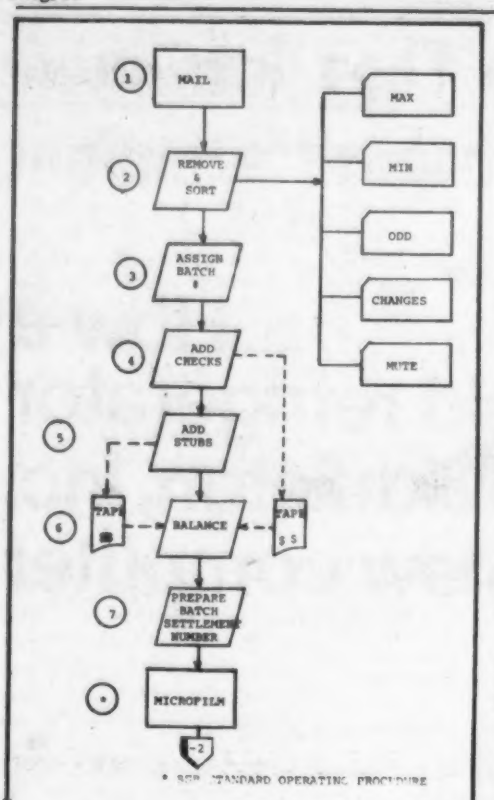
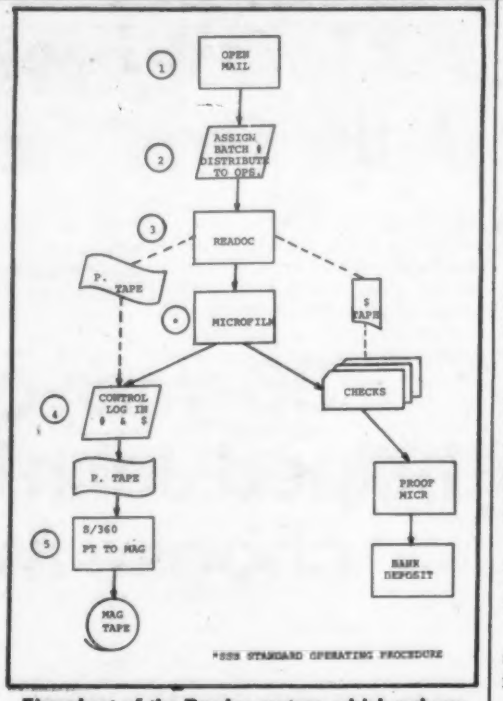


Flowchart of the procedure used by some firms to process incoming mail containing turnaround documents.



Flowchart of the Readoc system, which reduces 15 steps to 5 steps in processing mail containing turnaround documents.

Optical Reader's Purpose: Better Paperwork Flow

(Continued from Page 1)

30,000; 1-1/2 cents each for the next 30,000; and 1 cent each above 60,000. "Document" means the paper that goes through the optical unit. It does not include checks (or whatever other paper is paired with the returnable medium).

The price includes optics, key unit, adding machine, and computer input vehicle (magnetic or punched tape, or card). It also will include, in the near term, a PDP-8L computer, which can handle things like check digit calculations on account numbers and can put out messages (like change of name or address) on an extra-cost output unit.

The company has Readoc on the shelf. As of now, the reader is limited to 1428 font, but 1403 print font capability is in development, the firm said.

Allied Computer Systems also markets a device that sorts varied-size preprinted envelopes at 200/min into 11 pockets. Another unit runs programmed sorts on varied-size documents at 300/min, making an immediate sort of identified exceptions, such as address changes.

Listing Service Reports Misplaced Credit Cards

NEW YORK – A computer is helping to protect credit card customers from unauthorized use of lost or stolen cards.

The service is operated by Hot Line Credit Card Registry Service Inc., a firm that records the credit account numbers of its customers.

Dorian Sidney, president of the firm, described the service as a way for the charge customer to relieve himself of unnecessary problems caused by loss or theft. He added that all customer information is kept confidential.

"The new customer fills out an application form listing all his credit cards and their identification numbers," said Dorian.

"Once the numbers are verified as accurate, we record the vital information on our IBM 360/30.

"When a customer reports the loss of his cards, we check over the accounts with him and then immediately inform the companies involved, to prevent unauthorized use," he said.

Dorian added that his firm uses CRT terminals to access data for instant retrieval, so that information concerning lost cards can be sent to companies "within minutes" after being reported.

Warning Notices

The company serves card holders on a nationwide basis, and all subscribers are issued notices to be carried in the customer's wallet, warning potential thieves that the accompanying credit cards are protected by the hotline service.

Thirteen major types of credit cards, including those of department stores, oil companies, travel and entertainment plans, bank credit cards, and hotels are handled, in addition to small local firms.

"We can service any type of credit card a person may have," said Dorian.

Individual subscribers to the service pay a yearly fee of five dollars, for which an unlimited number of accounts can be recorded and changed as required. Commercial rates for company accounts are also available.

The firm is located at 200 E. 42nd St.

Computer Uses Pondered For Photochromic Glass

CORNING, N.Y. – New kinds of computer components may stem from glass that gets dark in ultraviolet light but regains its original transparency when the light is removed.

Two scientists at the Corning Glass Works reported that photochromic glass, as it is called, fulfills the basic requirements for information storage and display. The functions of writing, reading, and erasing information on the glass are all feasible, they said.

Writing is done in the form of spots on the glass caused by UV light beams, according to the researchers. Erasing is done with a different wavelength of light. Meanwhile, the glass keeps its spots long enough to be read without fading naturally.

The scientists, who reported their findings in a paper prepared for the annual meeting in September of the American Chemical Society in New York City, are Janice L. Stiles, laboratory technician, and Dr. R.J. Araujo, research associate, both in the fundamental chemical research group at Corning.

The reversible darkening and clearing action of photochromic glass compositions stems from tiny crystallites of silver halides in their formulae, Miss Stiles and Araujo said.

A commercial photochromic glass is used for prescription eyeglasses that turn dark in sunlight but clear again indoors and at night without UV stimulus.

SOME

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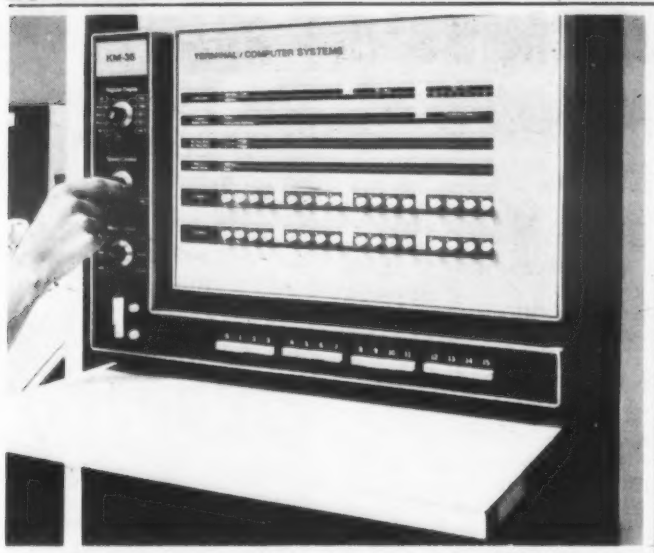

The KM-36 provides an interface between System/360 and up to 64 terminal devices of any manufacturer operating at a variety of transmission speeds through 2,400 baud.

Multiplexer Eases Burden On 360 Operating System

GREENWICH, Conn. – A new computer-controlled communications multiplexer is designed to relieve S/360s running under "the big OS" of the burdens, in time and core, of jobs like line control, line sampling and bit storage, character and message assembly, code conversion, and message editing.

The KM-36, according to its manufacturer, Terminal/Computer Systems, will multiplex up to 64 terminal devices of any manufacturer at speeds, currently, of up to 2,400 bit/sec.

The unit transfers full messages, at control unit speeds, to the 360. The new device looks and acts (to the 360) as a control unit that is "assigned" to the system as a 9-channel tape under sequential access. Thus, it can be addressed in higher-level languages, such as Cobol, Fortran, and PL/1.

KM-36 contains a read-only memory instruction set to solve multiplexing problems.

Proprietary software includes an interface to OS/360, an access method that eliminates the need for BTAM/QTAM, and an OS assembler.

This "system program" type of software means that the user or the manufacturer will have to make changes to the original OS/360 coding. CW asked IBM whether it would be willing to maintain OS under these circumstances. IBM said there would probably be a charge

A KM-36 system, configured to handle 16 low-speed and a combination of five medium- and high-speed lines is priced at $75,000. This cost includes a processor with a memory capacity of 16,384 bytes, data set adapters, line control units, all cabling, an IBM 360 interface, and associated software. The KM-36 is also available on a lease basis.

AT&T, IBM Deny They Infringed 'Touch-Tone' Terminal Patent

By V.J. Farmer
CW Staff Writer

WASHINGTON, D.C. – AT&T and IBM have denied charges of patent infringement leveled at them by Photo Magnetic Systems of Beltsville, Md.

Peter James, president and chairman of the board, formally notified the two companies by letter last week that they are joint infringers of U.S. patent No. 3,381,276, granted to Jones April 30, 1968, and subsequently sold to Photo Magnetic Systems.

The company claims that AT&T has been using and permitting others to use tone-generating telephone sets as part of computer systems supplied by IBM.

James said that similar notification will be sent to about 300 other data communications-computer manufacturers and users, such as banks and department stores using Touch-Tone telephones linked to computer systems.

An IBM spokesman said that James had brought his patent to IBM in 1968, and IBM had determined it had "no interest in or need for a license under his patent."

AT&T officials merely stated that they "were satisfied that there is no validity to the charge."

In his letter to the two companies, James emphasized that Photo Magnetic Systems, Inc. "is amenable to selling licenses to the . . . AT&T organization for linking the nation's telephone network to computer devices."

According to James, "The use of the ordinary telephone for data and command inputs for a computer presents a starting point but the mere use of the telephone is insufficient to achieve all of the prerequisites for a completely satisfactory commercial operation."

The patent states, "The invention might be more accurately described in terms of a computer mechanism or computer arrangement."

To be an infringement, therefore, it appears that the computer network or arrangement must include a tone-to-digital converter, a translator, the computer, respective data banks, and a desired program or series of programs.

"Such computer mechanism is then frequency responsive," according to the patent.

The patent also indicates, "It will be understood that opposed to using hardware in the form of a translator, so-called software can be incorporated in the computer whereby the tone-to-digital converter can feed directly to the computer.

"The telephone set . . . offers the required operational characteristics in that it functions as a key-operated frequency generator."

Photo Magnetic claims that these "computer systems" covered by the patent are now in use in such corporations as Westinghouse Electric, General Electric, U.S. Steel, Bee Plastics division of Amoco Chemicals, and Gino's; in hospitals, service bureaus, and hardware chains; in such government agencies as the National Labor Relations Board and the Defense Supply Agency; and presently are being tested by the General Services Administration for wide use throughout the government.

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OCR System Reads 600 Documents/Minute

DALLAS – An optical character-recognition system, Input 2, that reads both hand-printed and typed information is being produced by Recognition Equipment Inc.

The system reads both types of data, two lines per scan at a speed of 600 documents per minute, and records the information on magnetic tape in computer language for immediate further processing, according to the manufacturer.

Simultaneous line-printing and document-sorting are said to be possible during scan operations.

The Input 2 machine-printed basic vocabulary includes 40 characters, consisting of uppercase letters, numbers from zero to nine, and four special symbols.

The system reads several standard type faces and is not limited to highly stylized characters, says the manufacturer. The vocabulary is wholly contained on printed circuit boards and can be expanded to 120 characters in 10-character modules.

The hand-printing vocabulary consists of the basic numbers; the letters C, S, T, X, and Z; and plus and minus symbols.

According to Herman L. Philipson, company president, the only requirement imposed on the handwritten data is that the character be printed simply "without any loops or frills, allowing people to print very much the way they normally do."

The Input 2 system includes a three-pocket document transport, a general-purpose digital computer, a magnetic tape unit, and a line printer. The document transport can be expanded to 12 output pockets.

A 1,000-line/min line printer is available in addition to the basic 600-line/min unit; and three magnetic tape transports also can be added to the system.

According to the company, the Input 2 system is priced at about $550,000, or $14,050 per month on a five-year lease basis. First deliveries are said to be projected for the first quarter of 1970.

The company is located at 1500 W. Mockingbird Lane.

GE-100 Communications

PHOENIX – Users of the GE-100 systems now have a choice of four new communications controllers.

The SLC 111 is designed for asynchronous transmission over voice-grade lines at speeds in the 110 to 1,200 bit/sec range. The device rents for $210 per month, with a purchase price of $8,592.

The SLC 112, 113, and 114 are synchronous units. The SLC 112 transmits over common carrier Telpak lines at speeds up to 150,000 bit/sec. It is priced to rent for $300 per month (purchase $12,288).

The SLC 113 is rated at 2,000 or 2,400 bit/sec; the 114 at up to 150,000. Both operate over half-duplex, voice-grade lines, and both carry rental prices of $210 per month or can be purchased for $8,592.

All units have four-character buffers and disconnect capability to allow them to overlap data transfer with central processor operations. All models translate between ASCII and central processor codes.

First deliveries are scheduled for January, 1970, with new orders scheduled for six months after receipt of order.

Information is available from General Electric, Schenectady, N.Y.

Plotting Table

WEST LONG BRANCH, N.J. – A high-precision plotting table designed for preparation of printed-circuit and integrated-circuit photo masters is being produced by Electronic Associates Inc.

Called the 430/300, the table has an accuracy of 0.001 in. with repeatability of 0.005 in. over the 11 in. by 18 in. plotting area. The device has an optical writing system with aperture selection under program control, and film copies, either positive or negative, can be made.

According to the company, a Model 430 plotting control console drives the 430/300 either off-line from magnetic tape or on-line from a computer.

Deliveries are scheduled to begin late this year from West Long Beach.

620/i Tape System

SILVER SPRING, Md. – A tape system designed specifically for users of Varian 620/i computers is supported by an extensive software library, according to the manufacturer.

Designated the CO600 Linc tape system and manufactured by Computer Operations Inc., the product consists of a dual tape-drive assembly and controller.

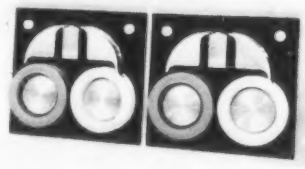
Data words of either 16 or 18 bits are stored in blocks of 256 words by the tape system. Each tape reel is said to contain 102,400 data words, or 12.6 core loads of an 8K machine.

Since there are two addressable tape transports, 204,800 words are available without changing reels, says the company. Up to three additional tape systems can be added to the 620/i at any one time.

Software supplied with the system permits the programmer to execute tape transfers with simple subroutine instructions. Computer dedication is required during tape search and data transfer operations.

Computer Operations Inc. is located at 11215 Oak Leaf Drive.

OCR System



620/i Tape System

One 9600 bps modem contains enough power to cure five common ailments.

COMMON AILMENT #1 SPASTIC DATA FLOW

When communications data is being transmitted or received by the computer, any simultaneous data processing efficiency is reduced. And the longer it takes for input/output, the longer data processing takes. At 1200 characters per second (9600 bps) data transfer is completed up to four times faster. That leaves the computer free to process more data, faster. It can do more work, more jobs — in less time. Maybe even save you from buying another computer.

COMMON AILMENT #2 HARDENING OF THE PERIPHERALS

Line printers can run at 600 lines/minute. Card readers can operate at 800 cards per minute. A 2400' reel of magnetic tape with 800 bpi can be transmitted in 30 minutes. But when they're running through 2400 bps modems, they don't! A Codex 9600 bps data-modem will bring your peripherals up to their fully rated speeds.

8-Month Symposium Planned

Privacy, Data Banks, Copyrights to Be Among Topics

WASHINGTON, D.C. – Privacy, data banks, copyright questions, and regulatory policy will be some of the issues examined by top government officials and leaders of the computer and communications fields in a multiple-session symposium beginning this month.

The symposium, "Computers, Communications, and the Public Interest," will be held one afternoon a month for eight months. Lecturers will include Professor Anthony G. Oettinger of Harvard, Professor Alan F. Westin of Columbia, and FCC Commissioner Nicholas Johnson.

Discussion periods following each lecture will include Ralph Nadar, Alain Entoven, and Harvey Brooks as discussants.

The free series will be held the second Tuesday of each month from 4 to 6 p.m. in the auditorium of the Johns Hopkins School of Advanced Studies, 1740 Massachusetts Ave., N.W., and is sponsored jointly by Johns Hopkins University and the Brookings Institute.

The symposium is addressed to the general public as well as decision-makers in government and industry, according to Johns Hopkins Professor Martin Greenberger, chairman of the symposium committee.

"We felt it important to bring together people from business, government, and society at large to help understand the complexity and wide ramifications of the new technology. The use of computers and communications has entered a phase where its relevance to society must be more than just acknowledged," Greenberger declared.

The eight sessions and the speakers are:

LARGE TIME-SHARING NETWORKS, Sept. 11. Speaker: Prof. John G. Kemeny, Dartmouth. Discussants: Jack Bertram, general manager, IBM Advanced Systems Development Division; and Alan J. Perlis, head of computer science, Carnegie-Mellon University. Presiding: Lee A. DuBridge, presidential science advisor.

DESIGNING ORGANIZATIONS FOR AN INFORMATION RICH WORLD, Oct. 9. Speaker: Herbert A. Simon, professor of computer science and psychology, Carnegie-Mellon. Discussants: Karl Deutsch, government professor, Harvard; and Martin Shubik, economics professor, Yale. Presiding: Rep. Emilio Q. Daddario, chairman, House Subcommittee on Science, Research, and Development.

COMPUTERS IN THE DECISION MAKING PROCESS, Nov. 13. Speaker: Anthony G. Oettinger, Harvard professor and chairman, Computer Science and Engineering Board, National Academy of Science. Discussants: Alain Entoven, Litton Industries; and Ithiel de Sola Pool, political science professor, MIT. Presiding: David Packard, deputy secretary of defense.

COMPUTERS IN EDUCATION, Dec. 11. Speaker: James S. Coleman, social relations professor, Johns Hopkins. Discussants: Patrick Suppes, professor of philosophy, statistics, and education, Stanford; and Eugene G. Fubini. Presiding: Wayne L. Morse, former chairman of the Senate Subcommittee on Education.

PRIVACY AND DATA BANKS, Jan. 8. Speaker: Alan F. Westin, professor of public law and government, Columbia. Discussants: Charles Schultze, former director of the Bureau of the Budget; and Ralph Nadar. Presiding: David L. Bazelon, chief judge of the U.S. Court of Appeals, Washington, D.C.

PROPERTY RIGHTS UNDER THE NEW TECHNOLOGY, Feb. 12. Speaker: Ralph S. Brown, law professor, Yale. Discussants: Benjamin Kaplan, law professor, Harvard; and Dan Lacy, McGraw-Hill Book Co. Presiding: Sen. Quentin N. Burdick, member, Senate Subcommittee and Patents, Trademarks, and Copyrights.

THE REGULATORY PROCESS, March 12. Speaker: Nicholas Johnson, member Federal Communications Commission. Discussants: Richard Posner, law professor, Chicago; and Lee C. White, former chairman, Federal Power Commission. Presiding: Kingman Brewster Jr., president, Yale.

MAN AND MACHINE: PROSPECTS FOR THE HUMAN ENTERPRISE, April 19. Speaker: George Wald, biology professor, Harvard. Discussants: Daniel Bell, chairman, Commission on the Year 2000; and Harvey Brooks, chairman, Committee on Science and Public Policy, National Academy of Science. Presiding: James Fisk, Bell Telephone Laboratories.

COMMON AILMENT #3 THE SLUGGISH CRT SYNDROME

CRT display-based information systems that share a common line to a computer also get to share a couple of problems: response time and thruput. With transmission to the central computer limited to 2400 bps, turn-around is badly delayed, reducing thruput. Bring it up to 9600 bps and your system timing is vastly improved. Watch your CRT's respond to a 9600 bps injection.

COMMON AILMENT #4 SWELLING OF THE PHONE BILL

Installations suffering from multiple 2400 bps thrombosis between network nodes ordinarily use four 2400 bps channels running parallel. A very impressive reduction in lease cost can be made by adding the four channel multiplexer option to the AE-96. The TM-4 concentrates four 2400 bps data channels into a single 9600 bps data stream ready for transmission over a single line. Network reconfiguration like this can save literally thousands of dollars every month, and can give you additional circuits that might not be available by any other means.

COMMON AILMENT #5 UNREQUITTED COMMITMENTS

Other people say they can cure your ailments — next year.

Not us. We're ready, willing, and able to talk price/delivery on our AE-96 modem. We put it in writing right here:

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The Codex AE-96 9600 bps data modem, with automatic adaptive equalization.

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Watertown, Massachusetts 02172

codex corporation

Service Matches People, Cars

EAST HARTFORD, Conn. – Dates and houses were just the beginning; now computers will match people with used cars.

Auto-mate Inc. is a service for used-car buyers. Prospective buyers go to a dealer who subscribes to the service and fill out a form describing the type of car they prefer. Using this form, Auto-mate gets a printout listing detailed descriptions and locations of all area cars that fit the criteria. The printout is sent to the client.

The service is free to used-car buyers. Dealers pay a flat fee plus a service charge for each car listed.

Dealers receive a daily list of prospective buyers for their cars, as well as monthly reports showing which models are doing well and which are not moving.

Editorials

First Impressions

Too often the first impression the public gets of a new computerized system is bad. And it's bad not because of the errors that are made, but because nothing is done to prepare the public for these errors.

Some installations, and we think they are the wise ones, send along a little note with the first public output of a system, a note stating that a new system is being put into effect and that there may be *human* (not computer) problems involved. These notes tell the recipient what *person* to call if he thinks an error has been made. This dispels the feeling that the recipient is at the mercy of a machine.

If you don't think this little note is worth its weight in gold, think back in your own experiences. As a computer user, you recognize an output error as originally having been a human error. But even with this knowledge, don't you burn quite a bit when you call or write to complain and get a reaction indicating that "the computer is never wrong"?

Computers and the Press

Public misunderstanding of computers has been fostered, in part, by daily newspaper stories on "computer errors." Too often newspaper stories blame the computer for programming errors or make the computers sound like thinking beings.

Therefore we were encouraged – but only a little – by newspaper reports of an $80 million error last month in a report on the wages of Ohio county employees. Apparently Glenn C. Buller, state supervisor of county and township records, went out of his way to tell reporters that it was a programming error, and the papers reported this fact – but deep inside the stories.

The *Cincinnati Inquirer* story started out, "A state official blamed the computer . . . " The United Press International story began, "A state government computer just couldn't understand how $105 million could be paid out in 1968 to county employees –so it revised the cost downward by $80 million."

Buller is to be congratulated for making the point that it was human error and not a hardware failure. If more DP people would make this point every time they deal with the daily press, they could help to get computers more favorable coverage.

Letters to the Editor

NCR Stage 1 Cobol Defended By Happy Century 100 User

I wish to take strong exception to the statements made about the Century 100 16K (Stage 1) Cobol, in your issue of August 13, 1969, "Users Unhappy With Software."

1. Stage 1 Cobol was clearly spelled out over a year ago by NCR and, as it currently exists, exceeds or fully implements, to the best of our knowledge, all promised aspects.

2. Stage 1 Cobol, while a subset in some respects, is a very usable and efficient version of standard Cobol.

3. We have used Stage 1 Cobol exclusively for approximately seven months and have over 150 operating programs in our library. We are using none of NCR's packages nor have we felt the need to do so. Our programs are used in such systems as: payrolls, general accounting, accounts payable, purchasing, sales backlog, cash projections, production control, numerically controlled tools, inventory, and labor analysis.

4. As pointed out, we are using Cobol exclusively and do not feel we will ever need to resort to assembly-level languages.

We are extremely pleased with our system, the hardware has run now for over six months with only a few hours down for minor problems. The operating system and utilities have been very very good, and Cobol is beyond our expectations.

Roger J. Horsfield
Manager Data Processing

Struthers Nuclear & Process Co.
Warren, Pa.

Throughput of 1,200 Records/Min Called Good Price/Performance

With respect to your article on "Problems With C-100 Software," I would venture a guess that better than 50% of the banks in the U.S. could live with a throughput rate of 1,200 records per minute. This figure equates to 72,000 per hour and, over an eight-hour day (or night), to 576,000 records. Amazingly good price/performance!

J.L. Hyde

J.L. Hyde Assoc.
Tiburon, Calif.

Coverage of 'Oracle' System Criticized by Burroughs User

It is a shame to see your objective reporting deteriorate when you pick up press releases such as RCA's announcement of the Equitable Life "Oracle" system [CW, Aug. 20].

NSC has been using *standard* Burroughs software products for over a year on the B5500, to do the things allegedly described as "firsts." The Burroughs TSS and Data Com MCP have provided this feature for a long time. We are a heavy user of Cobol from remote terminals, but we do all our work on *one* machine, switching from TSS to batch, depending on production schedules. Our production program runs under TSS and batch without change. Languages available are Cobol, Fortran IV, Algol, Basic. All debugging is done in source-level languages.

George D. Simon, Manager
Systems and Data Processing

National Starch & Chemical Corp.
New York

David H. Harris, vice-president for technical services at Equitable, stated that the on-line, in-house debugging aspect of the Oracle system was believed to be different from other concurrent Cobol and Fortran applications. He said the original statement had been based on his own research and data supplied by RCA. He conceded, however, that this type of claim is subject to many fast-changing variables. Ed.

Firm Offers Alternative System For Call/360 DataText Users

There seems to be an implication in your coverage of the recent SBC announcement of the cancellation of 360 Datatext service (July 30 and August 13) that the only alternatives to replacing that service involve remote terminals to time-sharing facilities.

Your own *Computerworld* in November reported our announcement of a system (Astrotype) which must be considered an extremely valuable alternative for Datatext users who have multiple terminals. It uses a dedicated PDP-8L to support up to four cable-connected IBM I/O writers. This system had as its design goal the replication of the editing and text-handling capabilities of Datatext which has been generally accomplished. A second product, Astrocomp, provides the necessary additional hardware and software capabilities to provide input to photocomposition devices.

David M. Carlson
President

Information Control Systems Inc.
Ann Arbor, Mich.

Computerworld welcomes comments from its readers. Preference will be given to letters of 250 words or less. *Computerworld* reserves the right to edit letters for purposes of clarity and brevity. Letters should be addressed to: Editor, Computerworld, 60 Austin St., Newton, Mass. 02160.

Data Communications -- Part III

Technical Problems Affect Data Interconnections

By Ronald A. Frank
CW Staff Writer

When the Federal Communications Commission, in 1968, handed down the now-famous Carterfone decision permitting private communications devices to be interconnected with the telephone system, an entirely new, but related set of problems developed.

As a result of the decision, a precedent was established. For the first time, commercial companies were competing in areas that previously had been limited to the regulated domain of the common carrier.

Data communications users would now have the opportunity to purchase and use privately manufactured equipment on their data lines. But it was not clear whether this would give the user cheaper or improved capability compared to what the common carriers could provide.

Predatory Pricing

The commercial firms foresaw a predatory pricing situation as a distinct possibility. They argued that since AT&T was regulated according to overall profit levels, it was possible that Bell might purposely lower data equipment rates in certain geographic areas to gain competitive advantage.

Also important was the question of message-switching and its exact definition. With computer users now interconnected with communications facilities, it was clear that transmitted data was not within the province of a common carrier chartered to provide message communications facilities. However, the dividing line between the two types of communications was far from clear.

After the Carterfone decision, AT&T filed a new series of interconnection tariff revisions that set rates for interstate data communications facilities. Although the new rates were approved after extensive consideration by the FCC, intrastate rates (regulated individually by the states) were not covered.

Are communications users basically satisfied with present facilities and services?
Does the typical user fully utilize his data capability?
Are present requests for data-link increases justified?
Are regulatory agencies concerned?
What does AT&T say?
In order to get the answers to these and related questions, CW talked to users, consultants, officials of regulatory agencies, and AT&T spokesmen. What emerged was the picture of a communications medium undergoing extreme changes. This is the third of a series of articles on these changes.

At present the FCC is very much concerned with the interconnection problems. In this regard, a series of informal conferences on questions resulting from the AT&T interconnection tariff revisions have been held.

Complaints Received

An FCC spokesman said that although the FCC is receiving complaints from data communications users, the main focus of attention is on the technical details pertaining to interconnection of data facilities. The source added, however, that the problems of individual users are being handled on a case-by-case basis, and the commission will receive details of each problem.

Recognizing that the technical aspects of interconnection must be fully and impartially defined before the tariff and related implications can be explored, the FCC requested that a scientific study group be formed by the National Academy of Sciences.

The NAS team has been formed, and meetings are scheduled to begin in September to complement the continuing FCC inquiry. A related study, by Stanford Research Institute, generally has been received with mixed feelings throughout the data communications community.

However, although the SRI report left many questions unanswered, the FCC has been accepting responses from various groups relative to the report.

The FCC inquiry is continuing to explore the entire interconnection problem. Meanwhile, the states are wrestling with the intrastate tariff problems.

Next week: Intrastate data tariff changes.

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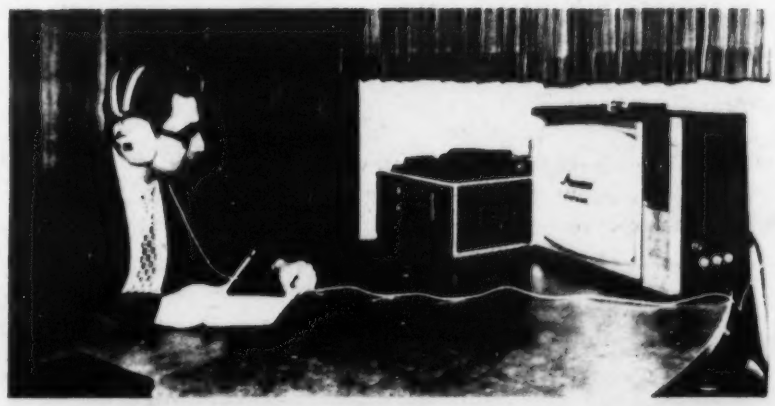

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Barely 2,000 Attendees at ACM Conference

"Why" by Lloyd Sumner, Computer Creations, Charlottesville, Va., was shown in the Computer Art Exhibition at the ACM Conference in San Francisco. Sumner used a Burroughs B 5500 Calcomp Plotter.

SAN FRANCISCO – Attendance barely topped 2,000, including 306 exhibitors and about 150 students, at the Association for Computing Machinery's annual conference, Aug. 26-28.

There were 32 well laid out, but lightly attended exhibits. The only mainframe manufacturers exhibiting were Univac, GE, and IBM.

Attendance at the conference apparently was hurt by the Share meeting the week before on the East Coast and by the Wescon conference in San Francisco, which directly preceded ACM's. There was a general feeling of conference fatigue on the part of attendees.

Dr. Marvin Minsky of MIT received the A.M. Turing award. His lecture and the other sessions were well attended.

Dr. Emanuel R. Piore of IBM, the luncheon speaker, said, "We as a group have collectively created a revolution in our society that has effected all elements. In the process, we have made some elements of our society uncomfortable. We are not being neglected. We may not be loved, but people are paying attention to us. The computer has become a tool that no one can live without, especially as our society becomes more complex. As far as the anticomputer backlash goes, we have a responsibility to help people understand how they cannot get along without computers."

He gave a further challenge to the academic community to develop the intellectual underpinnings to qualify the industry as a science.

"We need very badly a scientific base for our community. What is being done is just a drop in the bucket. As you look at the emphasis being placed in universities, it is in applications. Technology is in excellent hands. It had a firm scientific base from which to progress. Machine organization, programming, systems analysis, for example, are not in that good shape. Any firm science must have a set of measurements. Instead of this being done in industry, it should be done in the academic world where the bright young minds are coming along."

Courier announces *Executerm I*

Designed for the Time Sharing Computer User

Here is the data entry and retrieval terminal designed and engineered specifically for the needs of the time sharing computer user. In addition to being fully teletype compatible, the Executerm I offers the following exclusive features:

1. Variable Split Screen
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For further details on the operation, applications, and installation plans of the Executerm I write or call our Marketing Department.

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DEC COMPUTER USERS

You can now, in many cases, automate your inventory, payroll or other reports for less than the cost of a file clerk with **RPG** (Report Program Generator) immediately available for **PDP-8 PDP-9 PDP-10 PDP-15**

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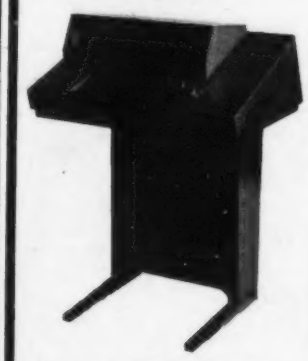
ASR-33's SHOULD BE SCENIC AND NOT HEARD



Your ASR-33 doesn't have to forever remain an ugly duckling whose staccato bark is worse than its bite.

Not when the new quiet TTY enclosure from Novation can give your office The Sound of Silence and The Look of Beauty for only $15 a month.

The Novation TE/33 is a modern enclosure especially designed for Model 32 and 33 ASR and KSR teletypewriters. It reduces the noise output of the TTY by 10 db.

What does 10 db mean to your people. A 50% reduction in noise level to their ear. By comparison, the TE/33 is 4 db quieter than an IBM Selectric.

What does this mean to your office? Increased employee efficiency. No more shouting over machine noise. The silent Novation enclosure will pay for itself in work time gained. And it looks as good as it sounds. It's available with a built-in acoustic coupler, too.

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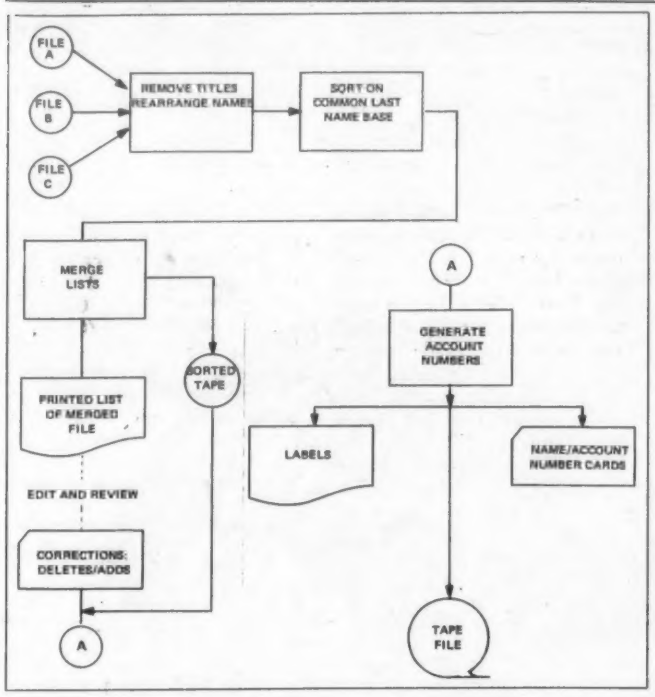

Flow diagram shows operations used to merge and sort three name files using the Bankserv File Streamliner.

File Streamliner Analyzes, Edits Multiple Lists of Mixed Names

CHERRY HILL, N.J. – A programmed system for analyzing and editing files containing lists of names is available from Arthur S. Kranzley Co.

Called the Bankserv File Streamliner, the package accepts variable-length files and variable-length name location records as input.

Operating on an IBM 360/30 under DOS, the package removes suffix titles (and Co., Inc., DDS, MD, III, etc.) and creates a 26-character leader with a reversed name configuration on all but business names that are unchanged.

The File Streamliner sorts and merges multiple mixed (personal, titled, and business name) files, provides correction capability, and generates account numbers of any length, with or without a modulus-11 or modulus-10 check digit.

Potential users include oil and insurance companies and magazine publishers (for subscription fulfillment applications) as well as banks.

Developed as an enhancement to the Bankserv charge card systems, the File Streamliner is said to be applicable to banking applications. The package facilitates development of a centralized information file for charge card applications and facilitates the use of existing files as a data base for new or expanded issues.

The package is priced at $3,600 and is said to be documented, installed, and warranted by the company. Offices are located at 383 Kings Highway.

TRW Offers First Commercial Package

REDONDO BEACH, Calif. – A computer-based information management system offering rapid and precise data selection is available from TRW's software and information systems division.

The product, called GIM (generalized information management), represents the entry of TRW into the commercial software market. TRW has been providing computer programs and services to the military for more than 15 years.

Robert Muchmore, vice-president and general manager of the division, said GIM is one of a series of software products to be made available by TRW during the coming year. Muchmore described GIM as a software system enabling managers to use a data processing system directly to obtain information when needed and in the correct form.

GIM can be readily installed in most large-scale data processing systems that meet minimum core and random-access storage requirements. Because of its simplicity, persons without knowledge of programming or computers can learn to use GIM effectively, according to TRW.

The program allows the user to communicate directly with his computer to ask specific questions and receive specific answers, using simple English language statements, says the company.

With GIM, expansion and modification of the user's data base can be made without reprogramming, thereby minimizing the need for single-purpose computer programs.

GIM is available from TRW under several alternate licensing plans tailored to accommodate the user's particular requirements. The system may be obtained for use on more than one installation at reduced costs.

The company is located at 1 Space Park.

Digital Offers Software Products Line, Support

MAYNARD, Mass. – Digital Equipment Corp. has developed a software product line to provide support for users of DEC equipment. According to the company, programming assistance is available in application areas such as process control, data communications, data reduction, information retrieval, biology, chemistry, numerical control, direct digital control, typesetting, simulation, financial analysis, commercial data processing, and special-purpose time-sharing. Product line manager Roger Pyle said the support group was formed at customer request after a six-month study. While new, Pyle points out that the group currently is working on three projects which include designing time-sharing software for an overseas stock exchange system, assisting in the development of programs for a PDP-10 typesetting system, and developing a PDP-8 process control system for the petroleum industry.

According to Pyle, the support group will work closely with sales and field service departments at the company.

Included in the software capability will be system design work including full turnkey responsibility, depending on customer requirements.

'Lists' Accesses New Library Records

ATLANTIC CITY, N.J. – A large-scale library processing system was demonstrated here at the American Library Association meeting recently. The system, called Lists (library information system time-sharing) was designed by Systems Development Corp. to perform basic library retrieval functions.

Lists provides the user access to records on new books, journals, and magazines stored in a central file.

The origin of the data base is a new series of magnetic tape-based listings provided by the Library of Congress, describing new books published in English.

In the area of periodicals, some 10,000 titles will be stored in the system, according to Donald V. Black, SDC project director.

An English-like language is used to retrieve information, the company said, thus eliminating the need for special training. Continuing evaluation and testing is currently under way between SDC and seven California libraries, the company says.

SDC offices are at 2500 Colorado Ave., Santa Monica, Calif.

'Omnitab' Designed to Manipulate Data on Multicolumn Worksheets

BETHESDA, Md. – A data manipulation service claimed to eliminate manual computations on multicolumn worksheets is available from International Telecomputer Network Corp.

Known as Omnitab, the program was designed to benefit those who currently spend numerous hours at desk calculators manipulating data on multicolumn worksheets. Using Omnitab, rapid results can be produced at desk-side from a portable, inexpensive, terminal keyboard after only a few hours of training, says the company.

The computer program was developed for routine use by mathematicians, statisticians, research analysts, actuaries, comptrollers, budget planners, and related professionals.

The heart of Omnitab is the multicolumn worksheet arranged in 49 columns of the worksheet, following which mathematical and manipulative operations are automatically interpreted and performed by the ITN computer.

Results may be printed seconds later at a keyboard terminal, punched into cards, or printed on a line printer.

ITN, a computer time-sharing firm, has offices at 7315 Wisconsin Ave.

Chicago T/S Service Offers APL Language

CHICAGO – Time-sharing with APL, the problem-oriented language, is now available from Computer Innovations, Inc.

The service is priced at $15 per hour, but the user is billed only for the amount of time actually used.

According to Joseph Mill, company president, this service is one of the first to offer APL.

The company's offices are at 10225 Southwestern Ave.

"The Question You Have To Ask Yourself Is Not 'Can I Afford It,' But 'Am I Man Enough To Handle This Much Computer.'"

Computer Tape To Microfilm Service Offered

ST. LOUIS, Mo. – Computerized microfilming is available as a service from the McDonnell Automation Co., according to Robert L. Harmon, company president.

The service converts computer-generated magnetic tapes directly onto microfilm at a speed of 20,000 lines per minute, using 16mm film.

The equipment used is the 3M Co.'s electron-beam recorder, which puts each 11 in. by 14 in. sheet of output onto a single frame.

Duplicate copies are produced as needed, and the cost for printing is claimed to be only 20% of the cost for computer-printed output.

Storage space requirements are reduced, according to the company, by as much as 96%.

The company is a division of McDonnell Douglas Corp. with an address at P.O. Box 516.

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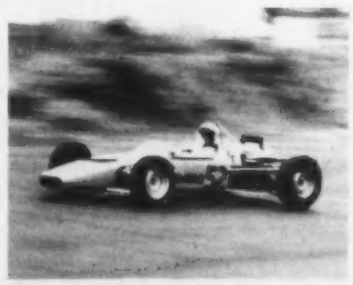

You can see the Computerworld Crosslé Ford at Sports Car Club of America events throughout the Northeast.

Transplant Donors Picked With Computer Matching

LOS ANGELES – Doctors in five Western states are matching available organs to desperately ill patients with the assistance of a computer.

The matching, using an IBM 360/91, at the UCLA medical center coordinates the characteristics of kidneys and other vital human organs to patients at transplant centers in California., Colorado, Oregon, Utah, and Washington.

Under the program, as many as 200 blood samples from potential donors and recipients arrive each week at Dr. Paul Terasaki's laboratory at the UCLA medical center. The blood's white cells are swiftly typed and classified, then stored in the computer.

Donors Are Typed

As donors become available and are typed, the computer searches its recipient pool. Recipients whose white-cell classifications are similar enough to the donor's to minimize transplant rejection are selected from the pool. Thus a kidney in Denver may be matched in Los Angeles to a recipient in Oregon and flown directly to the hospital in Portland.

The Terasaki testing method uses minuscule drops of antiserum and white cells known as lymphocytes. The lymphocytes are removed from the blood samples and classified in 120 different tests.

Then the description is recorded in the memory banks of the computer. There, tissue types of donors and recipients are compared so that close matches can be found. Dr. M.R. Mickey is in charge of the computer aspects of the project.

The computer at UCLA does much more than simply match tissue for organ transplants. Its continuing study of hundreds of transplants has helped scientists understand how closely tissue characteristics must be matched to offer hope of transplant success.

National Transplant Bank

Terasaki foresees the day when a computer will serve as a national center for organ transplants, with the organs all tissue-typed ahead of time and prepared for air shipment to transplant centers anywhere in the country.

The U.S. Public Health Service recently granted funds to UCLA for development of a communications system that would extend the network to other areas of the U.S.

Even today, the UCLA laboratory is doing this specialized work for hospitals as far away as Europe, South America, and Japan. Terasaki and his staff classify the plastic-packaged blood samples, usually the same day they arrive and airmail back the analyses.

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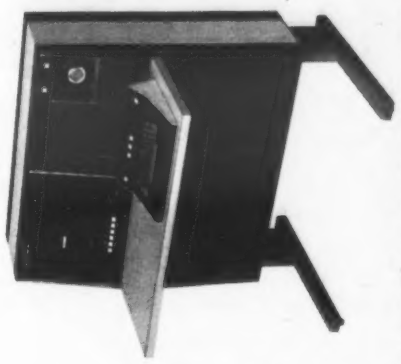

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Student Accounting Statements Computerized at Bowling Green

BOWLING GREEN, Ohio – A computerized accounting system, providing students and faculty with a single monthly statement for all services, has become a reality at Bowling Green State University.

School officials said the system – a model for state universities in Ohio – enables Bowling Green's 14,000 undergraduate and graduate students to pay on their accounts without specifying a particular fee or service.

The university uses an IBM 360/40 to calculate these fees, record other charges, process payments, print itemized statements, and maintain a current status.

After consulting with faculty advisors, students initiate the computer-based operation by indicating their approved course selections on special forms. The forms are run through a 1232 optical mark page reader, which produces a punched card. The data is then entered into the computer's student information file.

A computer program analyzes each student's schedule and charges the amounts due in his accounts receivable record. Variations in fees resulting from changes in schedules also are provided by the computer.

Transactions handled by the computer include charges for registration fees, tuition, room and board, laboratory materials, testing services, and parking permits, according to officials.

CRT Retrieval

Instant retrieval of this computer-stored data is achieved by use of 2260 visual display station terminals. Also available for immediate display on the CRT screen of the terminals is data on 30,000 alumni, information of 15,000 accounts payable, covering expenditures by the university to all vendors, data on budget expenses and cost accounting, and data on 19,000 records concerning students applying for admission.

A computerized accounting system provides a comprehensive monthly statement of services for students at Bowling Green State University.

Driver Records Accessed With CRT Terminals

TRENTON, N.J. – A computer-based information system is being used by the New Jersey Division of Motor Vehicles to handle millions of drivers' license records, vehicle registrations, and violation and accident reports.

June Strelecki, director of the motor vehicle division, said the new system was set up to improve service and will have a major impact on operating efficiency.

The computer, an IBM 360/40 backed up by a smaller Model 30, is equipped with CRT terminals.

Using these displays, department personnel can see – within seconds – information on motor vehicle records stored in the computer. This data is available, on demand, 24 hours a day, seven days a week.

The computer's capacity to store huge amounts of data is enabling the division to do away with millions of card files.

Involved in the changeover are about four million drivers' license records, 3.6 million motor vehicle registrations, and several million violations and accident files.

In later phases, the computer system will utilize terminals to help maintain drivers' license records, issue duplicate licenses, handle registration transfers when vehicles change hands, and prepare abstracts of driver records for insurance purposes. Terminals to handle some of these operations will be placed in field offices as well as at division headquarters.

Built-In Safeguards

Not all of the information stored in the computer, however, will be available to the field terminals, and safeguards have been built into the entire system to insure that records can be used only by authorized personnel.

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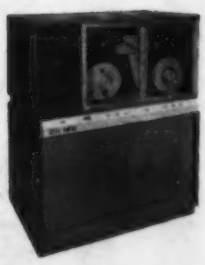

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TELEX NEWS TO COMPUTERWORLD FAST

How to evaluate Sigma 5, 360/44 and SYSTEMS 86 real-time computers.

Take a close look at price-performance.

Not just the words, but a detailed comparison—using actual computer kernels—of the real-time response and throughput rates of each computer operating in a multiplexed I/O mode. With a hard-nosed dollar-to-dollar cost comparison.

It shows one of these machines is not only 15% faster, but more than 15% less in price.

It's the one you helped design. Because it grew out of our experience in meeting your real-time hardware requirements. Satisfying your custom software needs. Solving your front-end application problems.

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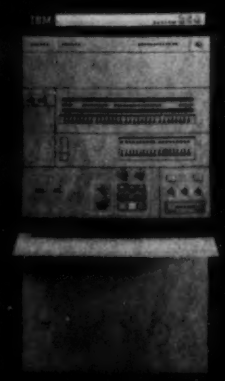
32-bit real-time computer
Memory cycle time—850 nanoseconds
Typical batch configuration—$435,000



360/44

32-bit real-time computer
Memory cycle time—1000 nanoseconds
Typical batch configuration—$475,000

SYSTEMS 86

32-bit real-time computer
Memory cycle time—600 nanoseconds
Typical batch configuration—$360,000

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I'd like to see the actual test results that show why the Sigma 5 came in second in your price-performance comparison.

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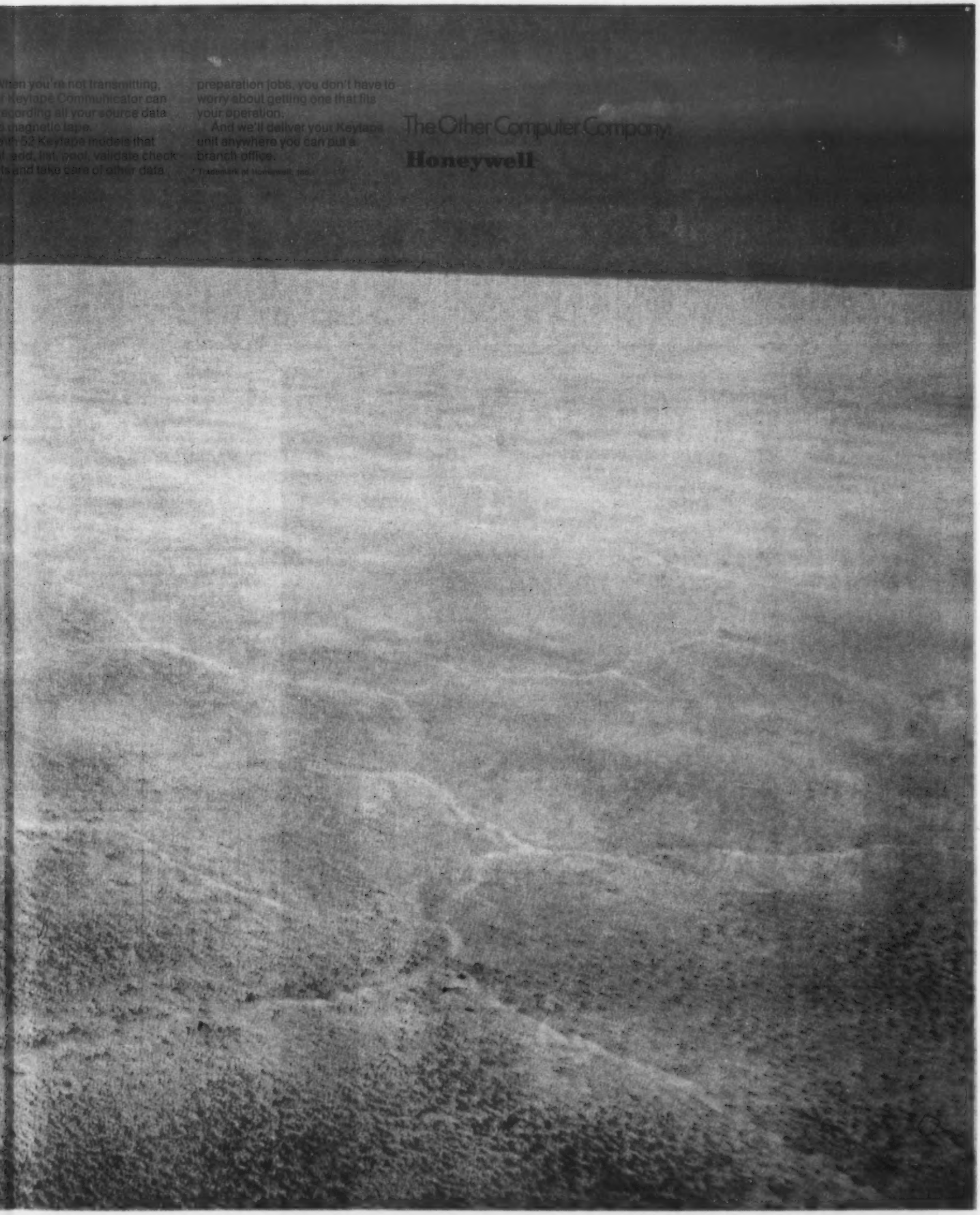
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Exposition at Brunel University May be Housed in Geodetic Dome

MIDDLESEX, England – Over 6,000 sq ft of the planned 6,500 sq ft of exhibition space has been booked for CG.70, the Computer Graphics Symposium and Exhibition to be held at Brunel University, April, 1970.

As a result, the organizers are planning to expand the exhibition. One idea being investigated is the erection of a mammoth geodetic dome. This could house the exhibition and could then be converted into a permanent university sports hall, which the students require.

A special feature of the symposium will be an introductory course for executives whose firms could use special techniques, but who have no specialized knowledge of computer graphics applications or equipment.

This field allows a lay person to directly utilize the power of a computer without having to learn any special programming language.

DP Center, Government Officials Move to Aid City's Unemployable

EL PASO, Texas – There are several major differences in a new data preparation center opened by University Computing of Dallas. The company is trying to help correct serious social problems in the city.

UCC's facility here handles Keytape operations on contracts for major corporations in the Western U.S., as well as for its own centers throughout the country.

Many employees in the center were unemployable only a few months ago in the El Paso labor market, which has the second-highest jobless rate in the nation.

The entire effort required the cooperation of officials of the city, the Chamber of Commerce, Project Bravo (the El Paso concentrated employment program of the Office of Economic Opportunity), the Texas Employment Commission, the U.S. Department of Labor, and Honeywell, Inc., which delivered the center's equipment on a crash basis.

The employees are primarily young women, whose new salaries in most cases are the only incomes in their family units.

Original job criteria called for applicants with a high school education and at least a basic familiarity with a typewriter. But before the training program was completed, some applicants with as little as a seventh grade education had been accepted, and one woman who had never before touched a keyboard was on the payroll.

The initial selection plan was to bring in 40 hard-core unemployed and 20 individuals with some previous clerical experience. But by the end of the training period, the ratio was 50 to 10, and all of those hired since have been in the hard-core unemployed category.

While a University Computing team was preparing the facility, representatives of Project Bravo and the Texas Employment Commission were handling the screening. Once the applicants had qualified, a three-member team from Honeywell in Dallas went to El Paso to launch the intensified training program.

University Computing executives said that the entire sequence of events was based on hard-nosed business decisions. However, the human part of the story is that young people gainfully employed had the bleakest of job prospects six months ago.

Since the opening of the center, UCC executives say that both the quantity and quality of the work produced equal the national average for the company as a whole.

Heald College Offers DP Degree

SAN FRANCISCO – A new program of study at Heald College of Business Administration offers the degree of Associate of Business Administration, with majors in accounting, secretarial, and data processing.

The program began with the summer quarter in July.

The college is on the quarter system, so the new program will allow a student to complete two academic years of study in eighteen calendar months.

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Clear Guidance, Understanding Of MIS Is Goal of New Society

CHICAGO – Management people and information systems professionals have felt the need for a new professional society dedicated to continuing evaluation of management information systems, development of meaningful informational programs and publications, and the conduct of original research and development where needed.

The Society for Management Information Systems, formed by a group of executives and management information systems professionals in November, 1968, feels that a void can be filled by an action-oriented professional group.

The only prerequisite for membership in SMIS is an interest in the goals, ambitions, and activities of the group.

There are five membership categories. Charter members and regular members pay annual dues of $30. Fellow members are those recognized by the society for their outstanding contributions to the field. Student members pay a fee of $5 per year.

Institutional members are corporations and other institutions that support the society and can benefit from its work. Institutional membership dues are $500 per year and provide for the following:

- One regular membership
- Listing in the society's publications
- The option to register five company representatives at meetings of the society
- Five copies of each SMIS research report, position paper, conference proceeding, and other publications.

SMIS, located at One First National Plaza, is incorporating in Illinois and has applied for tax clearance from the Internal Revenue Service so that income will not be taxable, and institutional members may deduct the annual dues as ordinary business expenses.

Management people have expressed growing concern over the lack of clear direction for MIS planning and development, and the need for better guidance and understanding of the complex disciplines and activities that are entailed. SMIS hopes to provide this guidance.

COMPUTERWORLD Societies

s m t w t f s calendar s m t w t f s

Sept. 15-26, New York – Seminar on the Computer Software Industry as an Investment. Contact Registrar, The Center for Professional Advancement, P.O. Box 997, Somerville, N.J. 08876.

Nov. 5-7, Boston – IEEE Northeast Electronics Research and Engineering Meeting. Contact: Nerem, 31 Channing St., Newton, Mass. 02158.

Nov. 10-11, New York – Digitronics Users Assn. Fourth Annual Conference. Contact: Secretary, DUA, Box 113, Albertson, Long Island, N.Y. 11507.

Nov. 17-21, Monterey, Calif. – Seminar on Systems Leadership. Contact: Tony Raitz, Systemation, Inc., P.O. Box 730, Colorado Springs, Colo. 80901.

Nov. 20-21, New York – 1969 Data Processing Conference. Contact: Registrar, Conference '69, P.O. Box 1926, Grand Central Station, New York, N.Y. 10017.

1970 JOINT AUTOMATIC CONTROL CONFERENCE, June 24-26, Atlanta, Ga.

Sponsoring societies are the American Institute of Aeronautics and Astronautics, the American Institute of Chemical Engineers, the American Society of Mechanical Engineers, the Fluid Power Society, the Institute of Electrical and Electronics Engineers, the Instrument Society of America, and the Simulation Councils Inc.

Authors are invited to submit full-length papers (no abstracts) for presentation at the conference. Papers dealing with all aspects of automatic control engineering and science (theory) design, applications, components, simulation, machine computation, etc.) are solicited.

All copies of papers should be clearly marked "For the 1970 JACC," and all papers should be submitted by Nov. 15, 1969.

Authors of accepted papers will be notified before March 1, 1970. All accepted papers will be reproduced in the JACC Preprint Volume.

Those interested in submitting papers through IEEE may submit, by Nov. 15, five copies of the complete paper for review to Prof. J.B. Lewis, Department of Electrical Engineering, Pennsylvania State University, University Park, Pa. 16802.

Conference program chairman is Prof. Donald W. Lyons, Sirrine Hall, Clemson University, Clemson, S.C. 29631.

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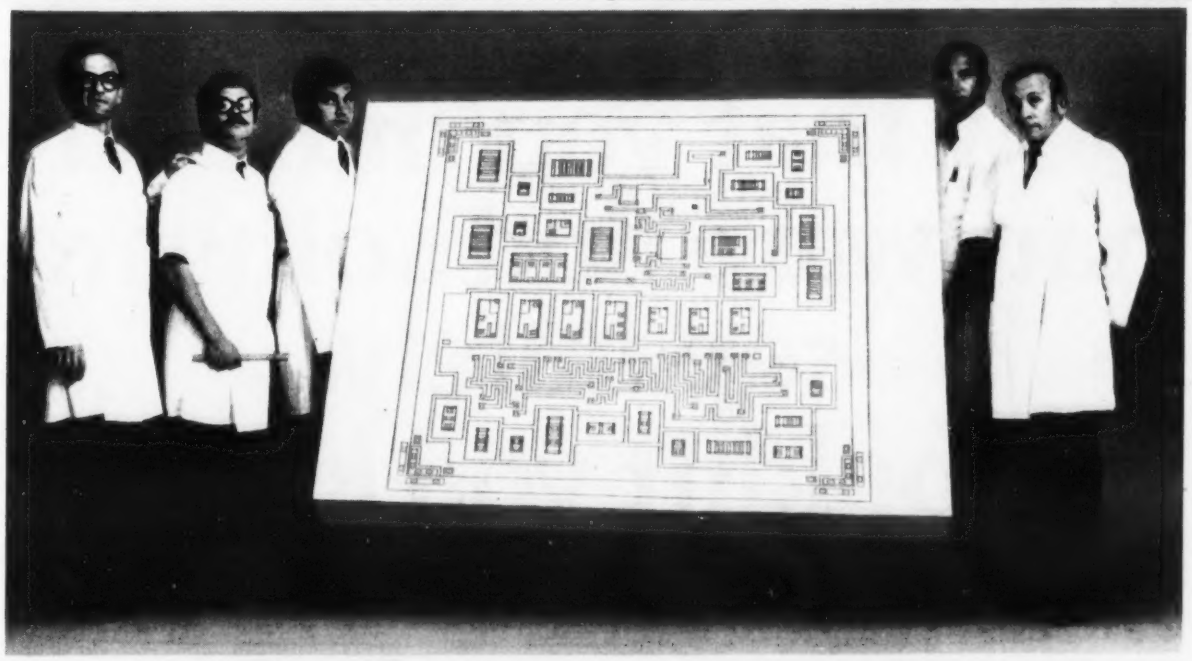

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New Literature

"The Continuing Education Handbook," a source of information on seminars, short courses, conferences, and workshops offered by colleges throughout the U.S., may be obtained at a cost of $20. Contact SiSi, P.O. Box 42576, Los Angeles, Calif. 90050.

A comprehensive report on the hardware and software compatibility of non-IBM alphanumeric CRT displays with System/360, developed by Programming Sciences Corp. for the Prudential Insurance Co. of America, is available at $50 from Programming Sciences Corp., 90 Park Ave., New York, N.Y. 10016.

A brochure describing an abbreviated Cobol system is available from Applied Data Sciences, 333 N. Michigan Ave., Chicago, Ill. 60601.

Brochures outlining Executive Computer Systems' service philosophy and capabilities to serve clients from computer room construction and equipment leasing through executive seminars and turnkey installation management are available from Executive Computer Systems, Inc., 1211 W. 22nd St., Oak Brook, Ill. 60521.

A brochure that describes Delta Systems Corp.'s approach to solving information problems using simple prose and a flowchart is available from the company's headquarters at Edens Executive Center, Wilmette, Ill. 60091.

A brochure describing all its computer program packages and services is available from Lex Computer Systems, Inc., Redwood City, Calif.

A brochure giving details on a seminar titled "Fast Start in Systems Analysis" is available from Systemation, Inc., P.O. Box 730, Colorado Springs, Colo. 80901.

A two-page bulletin that outlines Generation II, a new series of environmental work stations, may be obtained from Columbia-Hallowell Division, Standard Pressed Steel Co., Hatfield, Pa. 19440.

Three booklets are available from Ampex Corp., at Mail Stop 7-14, 401 Broadway, Redwood City, Calif. 94063. They are a description of the Ampex videofile information system, (G-307); operation of the Ampex Model TM-7 digital tape transport as an incremental drive unit, (C-085); and description, specifications, and a timing chart of the Ampex Model RGX, (CO98).

A 26-page electronic circuit analysis program reference manual is provided by Tymshare, Inc., Corporate Marketing, 525 University Ave., Suite 220, Palo Alto, Calif. 94301.

The Midwest office of URS Data Sciences Co., 800 Enterprise Drive, Oakbrook, Ill. 60521, is offering a four-page brochure covering its systems consulting and programming services.

School, DP Firm Sponsor Course In Programming

EL SEGUNDO, Calif. – Fifty-four junior and senior high school students and 14 instructors from the Compton Union High School District received diplomas for successfully completing a 20-week computer programming course sponsored by the Compton University Union High School District and Scientific Data Systems.

The intent of the program is to test a hypothesis that students schooled in digital computers will be further motivated to stay in school and complete their educations. Students will be monitored over an extended period of time to test the program's long-term effects.

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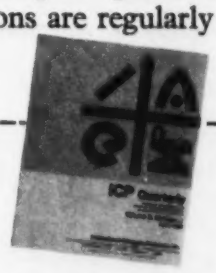

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Computer Technology for Sale

DALLAS – LTV Aerospace Corp. has announced that discussions are under way for the possible sale of its 71% interest in Computer Technology Inc. to the Prudential Insurance Co. of America.

The purchase price for such interest is valued at about $80 million, based on the approximate market value of Computer Technology Inc. common stock on Aug. 22, the date on which an understanding was reached.

As part of the transaction, Prudential plans, upon satisfaction of certain conditions, to transfer its computer operations to Computer Technology in exchange for shares of Computer Technology common stock also valued at approximately last Friday's market price.

Many important terms are still being negotiated and various conditions to consummation of the transaction remain to be met, including the approval of the New Jersey commissioner of banking and insurance.

Stockholders of Computer Technology will be asked to approve certain aspects of the transaction.

Datamation Drops 8 Cents Per Share in Report Half

NEW YORK – Sales for Datamation Services, Inc., for the six months ended June 30, 1969, were $2,499,853, compared with $2,751,349 for the same period last year.

For the period, the company incurred a net loss of $33,770, or 3 cents a share, compared with net profit of $92,138, or 8 cents a share, for the same period last year.

For the second quarter ended June 30, Datamation Services had sales of $1,238,515, compared with $1,357,443 last year. A net loss of $42,188, or 4 cents a share, was incurred for the quarter, compared with a net profit of $99,305, or 9 cents a share, last year.

Results for both years reflect the acquisition of Computer Systems & Education Corp. (CSEC) on March 7, 1969. CSEC and its subsidiaries operate schools for training computer operators, programmers, and technicians. CSEC also has a data processing service bureau operation.

President Thomas T. Connors attributed the first-half decline to these factors:

■ The cash-flow pattern of Datamation's new CSEC subsidiary tends to distort the parent company's interim reporting. The computer schools that CSEC operates have relatively constant overhead each month, but most students commence classes during the second half of the year, and the major income is recorded after the student commences class. This works against first-half figures and in favor of the second half.

■ A substantial reduction in the volume of business done with one of the company's major customers required increased sales and promotion expenses during the first half, in order to generate replacement business.

■ Start-up costs in connection with plant, facilities, and software development that are not expected to contribute to earnings until the second half of 1969 and in 1970.

Connors commenting on the third factor, said the company's New York service bureau has been expanded and two additional computer systems installed.

This has added to overhead before the new equipment and facilities can be effectively utilized. The company also incurred considerable sales and start-up expense in the first half, through the development of four new packaged computer programs for handling accounts receivable, accounts payable, inventories, and invoicing.

These programs, designed primarily for marketing to medium-size companies, are creating substantial new and recurring business and are expected to develop considerably more in the second half and next year, he said.

Leasco Pergamon Deal Still Alive

By a CW Staff Writer

LONDON – Leasco's bid for Pergamon Press Ltd. appears to be back on course after a slight detour last week as Leasco announced it was withdrawing its $60 million offer.

After a round of name-calling, alleged damages suffered, unclear financial statements, claims that Leasco didn't have the cash, postponed take-over panel hearings, questions in the negotiation meetings, and other nonpublished reasons, a spokesman for Leasco's financial adviser in London, N.M. Rothschild & Co. indicated that the deal was back in force.

It appears that the major problem was solved by establishing a new ratio of price/earnings that Leasco will pay for shares it hasn't already bought.

This ratio breaks down into Leasco paying 25 times the annual average of attributable earnings for the years 1968 and 1969 for publicly held shares, but only 19 times these earnings on the shares held by Robert Maxwell, chairman of Pergamon.

SDC Viewpoint – Part I

SDC Set to Go Public After 18-Month Period of Proving Its Profit Performance

By Phyllis Huggins
Special CW Correspondent

SANTA MONICA, Calif. – "Profits are beautiful!" This best sums up the present attitude at System Development Corp. in Santa Monica.

Since 1956, a nonprofit organization believing that "nonprofit is next to Godliness," it is now metamorphosing into a tax-paying member of the hard, cruel world. And everyone is beaming.

The gleam in the employees' eyes is in good part the prospect of stock options, but there is also a feeling that this is the right way to go for fuller development of the potential within SDC.

SDC will not go public immediately. An 18-month period will be spent to establish a track record of profits so the investing public will not be buying on "speculated" profitability.

There then will be an actual performance to demonstrate capability and SDC will go public at the end of this period.

"We have talked to a large number of corporations that were interested in acquiring SDC, we have made many studies, done a great deal of soul searching and analysis. We feel convinced that the path we have taken is the best one to protect the characteristics of SDC and insure its growth," said Wesley S. Melahn, SDC president.

As yet, no decision has been made on how many of SDC's employees will take part in the stock-option incentive plan.

This will not be decided until a board of directors has been appointed and forms the policy.

The board will include representatives of the investment group and representatives from the academic, scientific, and corporate fields. It will be selected shortly.

The step SDC took is unique in the computer industry and rare in the entire field of industry. Never before in the computer industry has such a large nonprofit firm become a profit firm, and never have so many investment firms joined together to back such a venture.

Lehman Brothers heads a team comprised of 13 of the top investment firms in the country.

The proceeds of the purchase of an interest in SDC by these firms will go to SDC's trustees to form a nonprofit foundation called System Development Foundation.

They will use the monies gained to support scientific research and educational programs in the computer technology field. The foundation will retain a major nonvoting interest in the new corporation, but will not have any connection with the management and policy of SDC.

What inspired the investment group?

SDC is one of the largest employers of programmers in the world. And today, programmers are synonymous with money.

SDC has 3,200 staff members, with facilities in eight major cities in the U.S. For the fiscal year ended June 30, 1969, its gross income exceeded $60 million.

By comparison, Computer Sciences Corp., with a much more varied range of business interests, has 3,600 employees and gross income for the last fiscal year was $64,883,000. More than 58% of SDC's employees have been with the corporation five to ten years. This is a conspicuous record for this industry.

Staff members represent about 20,000 man-years of experience on more than 1,500 contracts in the field of information technology and the system sciences.

President Melahn pointed out that profit return on software is not big. Return on investment is.

"The really well-managed firms are making 5-6%. We do not expect to make this right at the start, but believe we will attain it in two years."

Last year SDC showed a 15% growth in gross revenues. Due to cut-off of the MOL project and other reduced military spending by government, Melahn does not expect to equal that growth rate this year.

Gross revenue will be just above $60 million, he said. "Fifteen percent growth rate is expected of SDC, but we may not make it this year."

Thirty to 60 employees are being let go because of the MOL cut-off, but no further reduction of personnel is expected due to military contracts or the change to profit status.

Next week – CW looks at SDC's new commercial division.

Planning Research Jumps Earnings 52% Per Share

NEW YORK – Planning Research Corp. has released a preliminary, unaudited earnings estimate of $2,884,000, or 64 cents per share, for the fiscal year ended June 30, 1969, up 52% over the 42 cents per share earnings reported for the previous year.

On a restated basis, to include six acquisitions pooled in the 1968 figures, earnings per share were up 19% over the 54 cents per share for that period.

Dr. Robert W. Krueger, president of Planning Research, also told a recent meeting of the New York Society of Security Analysts that he sees no boundary to the growth of service organizations like Planning Research..

"We have grown eightfold in the past five years," he said, "and I expect that we will continue to grow at an average rate of 30% to 40% per year for the next several years."

"Preliminary agreements recently have been reached," he said, "to acquire The Jacobs Co., Inc. of Chicago, consultants in public administration and public finance; Economics Research Associates (ERA) of Los Angeles and Washington, D.C., management consultants in land economics and specialists in recreation and leisure-time research; and Bureau Verlinden-Willemsen, a hospital systems design and consulting firm in The Netherlands.

Krueger said that these firms had added to the corporation's earnings, and that Jacobs and ERA are included in the reported figures.

The annual earnings compare to $1,364,832, or 42 cents per share reported in fiscal 1968. Gross revenues for 1969 were $56,968,000, up 143% over the $23,435,007 reported for fiscal 1968.

Gross revenues and earnings per share on a fully pooled and restated basis for fiscal 1968 were $49,982,246 and 54 cents per share respectively.

Krueger also reported that Planning Research common stock has been accepted for listing on the New York Stock Exchange, effective Sept. 19, 1969. The stock has been listed on Amex and the Pacific Coast Stock Exchange.

MDS Arranges for Latin Marketing

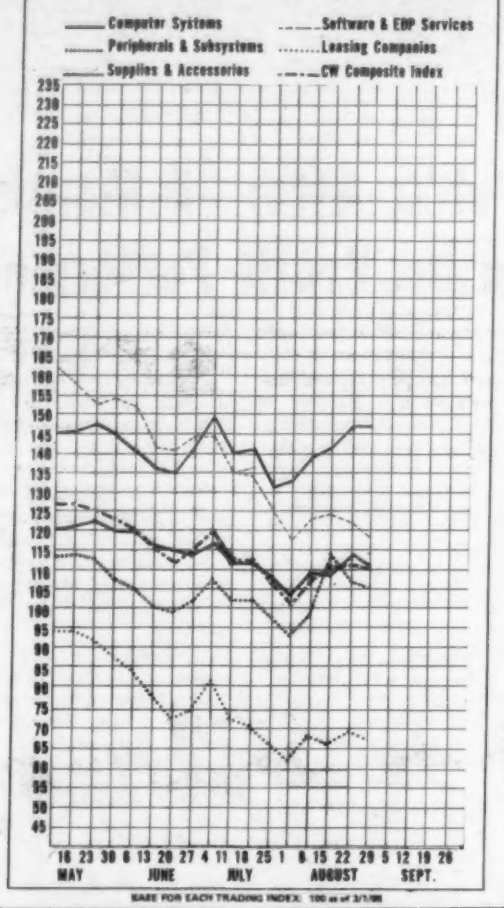
NEW YORK – General Telephone & Electronics International will market the Mohawk Data computer peripheral product line in Latin America under a long-term contract.

Mohawk emphasized that the Latin American market offered unusual opportunities for computer input, output, and communications equipment.

The population of central processors in the area is growing, as is the awareness of the need for improved I/O capabilities in these installations, according to Mohawk.

While this is the first time GT&E International has entered into an agreement for the marketing of electronic data processing products, the company has extensive sales, service, and manufacturing facilities in Latin America.

Computer Stocks Trading Index



BASE FOR EACH TRADING INDEX: 100 as of 3/1/68

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Leasing Growth Depends on Money Source and Cost

By A.B. Williams
CW Staff Writer

Leasing company stocks have taken a pretty thorough pasting over the past few months. CW's index of leasing stocks peaked during the week ended Jan. 24 at better than 30% over its March 1, 1968, base.

The index now stands between 65 and 70, showing a loss from a peak of nearly 50%.

Aside from the hindsight observation that many stocks were overpriced, even unrelated to current developments, the pitfalls that lie in the path of leasing managements have been clearly shown.

How to Grow?

Lessors (computer lessors in particular) are in a business in which growth depends on the ability to generate new money. The newer the company, the less equipment it has generating the only really healthy kind of new money — profits.

The other classic ways of getting new capital are selling stock and borrowing. The idea of selling stock often doesn't appeal to shareholders, who see dilution of their equity as a sure result.

That leaves borrowing, and that has become very expensive over the last few months. Leasco acknowleged this very dramatically, by announcing that they would not be acquiring new equipment for leasing in this country.

A look at break-even problems will help. Considering interest rates, plugging in a factor by which the company figures it must undercut IBM rentals, and figuring that the equipment is priced by IBM at 48 times monthly rent, yields the following results on months to break even.

At 6% interest (low by current standards) and with a 10% undercut, a new computer will take 62 months to break even, and that's not allowing for company overhead or profit.

At 8%, and a 20% cut, the break-even point is reached at 78 months.

That is to say, even without true break-even or profit, the new machine won't be written off until sometime early into the fourth generation.

Good Side?

There probably is a pot of gold at the end of the rainbow, but the time frame demands a great deal of patience from management and stockholders alike.

Some companies follow(ed) a policy of writing only (or mostly) full-payout leases. Others have established prices that yield a break-even point at somewhere between five and seven years, with the latter more common.

The good side, of course, is the residual value of the equipment. The 1401 held up pretty well in this respect, and there is no reason to believe that 360 won't too. After all, IBM has had a large stake in returned equipment, and has not done badly in getting the last bit of profit from it.

COMPUTER STOCKS: TRADING SUMMARY

CLOSING PRICES 8/29/69

COMPUTER SYSTEMS

EXCH	1969 RANGE	CLOSING PRICE			WEEK NET CHANGE	WEEK % CHANGE
N	153-120	152	1/4	BURROUGHS CORP	+ 6 1/4	4.28
N	69- 38	43	1/4	COLLINS RADIO	+ 7/8	2.06
N	159-125	151	1/2	CONTROL DATA CORP	+ 1 1/2	1.00
A	74- 54	73	3/4	DIGITAL EQUIPMENT	+ 7/8	1.20
N	25- 13	16	3/8	ELECTRONIC ASSOC.	+ 7/8	5.65
N	98- 81	83	3/4	GENERAL ELECTRIC	- 1	-1.18
N	95- 75	91	1/4	HEWLETT-PACKARD CO	+ 2 5/8	2.96
N	140-107	137		HONEYWELL INC	- 1 3/4	-1.26
N	354-291	345		IBM	- 5 1/4	-1.50
N	139-108	136	7/8	NCR	+ 3 5/8	2.72
N	48- 35	37	1/4	RCA	- 1 3/8	-3.56
N	50- 30	35	3/8	RAYTHEON CO	+ 5/8	1.80
O	43- 24	29		SCI. CONTROL CORP.	- 1 1/4	-4.13
N	55- 38	44	3/4	SPERRY RAND	+ 1/4	.56
A	39- 26	38		SYSTEMS ENG. LABS	- 5/8	-1.62

PERIPHERALS & SUBSYSTEMS

EXCH	1969 RANGE	CLOSING PRICE			WEEK NET CHANGE	WEEK % CHANGE
N	88- 59	70	1/8	ADDRESSOGRAPH-MULT	+ 2 1/8	3.13
O	71- 17	17	5/8	ALPHANUMERIC	- 1/4	-1.40
N	44- 32	42	1/4	AMPEX CORP	+ 7/8	2.11
O	19- 9	11	3/4	BOLT,BERANEK & NEW	- 3/4	-6.00
N	17- 9	12		BUNKER-RAMO	+ 7/8	7.87
A	37- 18	23	7/8	CALCOMP	+ 1/8	.53
O	38- 17	17		COGNITRONICS	- 1 1/2	-8.11
A	16- 8	9		COMPUTER EQUIPMENT	+ 1/8	1.41
A	27- 12	14	1/8	DATA PRODUCTS CORP	- 3/4	-5.04
O	22- 13	17		DIGITRONICS	- 2	-10.53
N	62- 0	60	3/8	ELECTRON MEMORIES	- 3/8	-.62
O	62- 43	8	1/2	FABRI-TEK	- 1/8	-1.45
O	37- 17	17		FARRINGTON MFG	- 2 1/4	-11.69
O	21- 10	12	1/2	INFORMATION DIS	- 1/2	-3.85
A	34- 17	25	7/8	MILGO ELECTRONICS	+ 2 5/8	11.29
A	89- 59	87	7/8	MOHAWK DATA SCI.	- 3/8	-.42
O	118- 54	56		OPTICAL SCANNING	- 1	-1.75
O	31- 18	21	1/2	PHOTON	+ 1 1/4	6.17
A	35- 23	30	1/2	POTTER INSTRUMENT	+ 1/2	1.67
O	76- 54	62	1/2	RECOGNITION EQUIP	- 2	-3.10
N	61- 22	26	7/8	SANDERS ASSOCIATES	+ 1 1/8	4.37
O	85- 32	34		SCAN DATA	---	----
O	36- 16	20		TALLY CORP.	---	----
N	100- 85	95	7/8	XEROX CORP	- 1 7/8	-1.92

SUPPLIES & ACCESSORIES

EXCH	1969 RANGE	CLOSING PRICE			WEEK NET CHANGE	WEEK % CHANGE
O	47- 31	35	1/2	ACME VISIBLE	---	----
N	22- 11	12	1/4	ADAMS-MILLIS CORP	- 1/8	-1.01
O	27- 23	23	1/4	BALTIMORE BUS FORM	---	----
A	29- 17	20	3/4	BARRY WRIGHT	+ 1/2	2.47
O	44- 28	28		DATA DOCUMENTS	- 1/4	-.88
N	42- 28	30		ENNIS BUS. FORMS	+ 1/2	1.69
N	94- 65	90	3/4	MEMOREX	- 3 1/4	-3.46
N	112- 94	108		3M COMPANY	- 1 1/8	-1.03
O	37- 29	32	5/8	MOORE BUS FORMS	- 1/2	-1.51
N	47- 36	45	1/2	NASHUA CORP.	- 1/2	-1.09
O	48- 30	38	1/2	REYNOLDS & REYNOLD	+ 1/2	1.39
O	31- 23	24	3/4	STANDARD REGISTER	- 3/4	-2.94
N	36- 28	28	1/4	UARCO	---	----
A	20- 10	12	1/2	WABASH MAGNETICS	- 3/8	-2.91
O	34- 28	31	1/2	WALLACE BUS FORMS	- 1/2	-1.56

SOFTWARE & EDP SERVICES

EXCH	1969 RANGE	CLOSING PRICE			WEEK NET CHANGE	WEEK % CHANGE
O	14- 6	6		ADVANCED COMP TECH	---	----
A	39- 6	23	1/2	APPLIED DATA RES	- 1 1/4	-5.05
O	19- 6	8		ARIES	- 1/4	-3.03
A	83- 63	83		AUTOMATIC DATA PRC	+ 3 1/4	4.08
O	13- 7	7	1/4	AUTO SCIENCES	- 1/2	-6.45
O	17- 7	7	1/2	BRANDON APPL SYS	- 1	-11.76
A	21- 9	11	1/2	COMPUTER APPL	- 1 7/8	-14.02
O	16- 6	9	1/2	COMPUTER ENVIRON	---	----
O	47- 22		----	COMPUTER NETWORK	---	----
N	30- 19	21	5/8	COMPUTER SCIENCES	+ 3/8	1.76
O	40- 8	9		COMPUTER USAGE	+ 1	12.50
A	56- 37	54	3/4	COMPUTING & SOFT	+ 1 3/4	3.30
O	24- 6	6	1/2	DATAMATION SERVICE	- 1/2	-7.14
O	17- 7	7	1/2	DATATAB	- 1/2	-6.25
O	15- 5	5	1/4	DIGITEK	- 1/2	-8.70
A	38- 12	13	5/8	ELECT COMP PROG	- 1 5/8	-10.66
O	30- 19	19	1/4	INFORMATICS	- 4 3/8	-18.52
O	19- 3	4	1/8	MATRIX CORP.	---	----
O	22- 6		----	NAT COMP ANALYSTS	---	----
A	34- 23	33	3/8	PLANNING RESEARCH	+ 3/8	1.14
O A	11- 6	6		PROGRAMMING & SYS	- 1/4	-4.00
O	10- 6		----	SOFTWARE SYSTEMS	---	----
O A	37- 5	5		STRATEGIC SYS	---	----
O	36- 11	16		TRS COMP CENT INC.	- 2 1/2	-13.51
O A	12- 4	4	1/2	UNITED DATA CENTER	---	----
O	155- 56	71	1/4	UNIVERSITY COMP	+ 1 1/4	1.79
O A	38- 22	25		URS SYSTEMS	- 2	-7.41
O A	16- 7	8	3/4	U.S. TIME-SHARING	+ 1 1/4	16.67

LEASING COMPANIES

EXCH	1969 RANGE	CLOSING PRICE			WEEK NET CHANGE	WEEK % CHANGE
O A	14- 8	12	1/4	BANISTER CONTIN	+ 3/8	3.16
O	45- 24	28		BOOTHE COMPUTER	+ 2 3/4	10.89
O	18- 4	4		COMPUTER EXCHANGE	- 1	-20.00
A	34- 10	10	5/8	COMPUTER LEASING	- 1/8	-1.16
O	12- 7	9		CYBER-TRONICS	- 1/2	-5.26
A	60- 23	28	3/4	DATA PROC. F & G	+ 1 1/8	4.07
O	16- 6	6	3/4	DATRONIC RENTAL	---	----
A	52- 31	32	3/4	DEARBORN COMPUTER	- 1 1/4	-3.68
A	16- 9	9	5/8	DPA, INC.	- 1/8	-1.28
A	45- 16	20	3/4	GRANITE MGT	+ 1/4	1.22
A	28- 12	14		GREYHOUND COMPUTER	- 1/8	-.88
N	54- 23	25	7/8	LEASCO DATA PROC.	- 1 5/8	-5.91
O	9- 4	4	3/4	LECTRO COMP LEAS	- 1	-17.39
A	57- 24	26	1/2	LEVIN-TOWNSEND CMP	- 3/4	-2.75
O	8- 3	3	3/4	LMC DATA, INC.	+ 1/8	3.45
O	14- 4	4		MANAGEMENT ASSIST	- 1 1/8	-21.95
O A	12- 6	7		NCC LEASING	- 1/2	-6.67
A	43- 18	34	1/2	RANDOLPH COMPUTER	+ 2 7/8	9.09
O	34- 6	6	1/2	SYSTEM CAPITAL	- 1 1/2	-18.75
A	28- 13	15	1/8	U.S. LEASING	- 1/8	-.82

Contracts

Hazeltine Corp., Little Neck, N.Y., has received a letter contract award from Naval Air Systems Command for production of AN/APX-76 airborne identification friend or foe interrogator equipment to be used in Navy and Air Force aircraft. The award carries a maximum obligation of about $10 million.

An $831,000 contract has been awarded to General Research Corp. of Santa Barbara, Calif., to design and install an advance command/control system for the Los Angeles fire department. The system will be developed around third-generation computers to call fire-fighting and rescue units to the scene of an emergency by selecting the correct and available emergency equipment, as well as performing many routine chores to free clerical and uniformed personnel for more efficient use.

Computer Sciences Corp. of Los Angeles has been awarded a contract to develop a computerized information system that will enable the U.S. Army to determine rapidly the cause of Army aircraft accidents and establish appropriate preventive measures. The award, valued at $583,000, was made by the U.S. Army Board for Aviation Accidents Research, Fort Rucker, Ala.

Ampex Corp., Redwood City, Calif., has received a $350,000 contract from Automated Systems, Inc., Norwood, N.J., for 100 Model TMZ digital tape memory systems to be incorporated in various new data processing systems developed by Automated Systems for on-line and off-line use. Automated Systems develops and markets special-purpose digital systems to interface with nearly all large-scale computer systems.

Computer Data Systems, Inc. of Silver Spring, Md., has been granted a $40,000 contract from the National Science Foundation to assist in the development of a financial accounting system. Computer Data has also received a $54,000 contract from Shell Oil of France for data processing design and development work to be done in Paris.

Informatics, Inc. of Sherman Oaks, Calif., has been engaged by the Federal Reserve Bank of New York for the planning, equipment analysis, design, and implementation of large-scale computer systems. The systems will automate much of the bank's data handling in analyzing and implementing in connection with national monetary policy. The communication system will include the capability for message switching, the accumulation and processing of related accounting data, and the interconnection of computer configurations within the bank.

Digital Development Corp. of San Diego, Calif., has received the second sizable increment of a long-term production contract for DDC 73 Series digital memory units from the Hewlett-Packard Co. of Palo Alto, Calif. To date, the contract is valued at about $1.5 million.

Control Data Wins $30 Million Army Contract

MINNEAPOLIS – One of the largest contracts for data processing equipment ever awarded by the U.S. Army has been won by Control Data Corp.

The equipment contract, valued at over $30 million, calls for installation and maintenance of 13 CDC 3300 computer systems in Army Materiels Command (AMC) supply depots throughout the country.

The new systems will significantly increase AMC's automatic data processing capabilities in more than 20 management areas. Each depot will be able to expand current information maintenance, production control, inventory control, finance accounting, personnel recording, payrolls, traffic management, and a number of other related accounting functions.

The first CDC 3300 system was installed at the Logistics Systems Support Center (LSSC) in Chambersburg, Pa., in June, 1969. During the next year the additional systems will be installed at depots in Texarkana, Texas; Sacramento, Calif.; Lathrop, Calif.; Anniston, Ala.; Park Forest, Ga.; Tooele, Utah; Lexington, Ky.; Pueblo, Colo.; Tobyhanna, Pa.; New Cumberland, Pa.; and the aeronautical depot maintenance center, Corpus Christie, Texas.

The new system is an extension of AMC's Systemwide Project for Electronic Equipment at Depots (Speed). Speed, now renamed Speedex, represents the depot production level of the command's overall national automatic data processing program for Army logistics management.

Each system will be equipped with Control Data's Master software system, providing multiprogramming capabilities of the 3300 by running a large number of programs simultaneously stored in computer memory.

Remote card, printer, and display functions will be provided by Control Data 200 user terminals connected to the computers by telephone lines.

The computers will also be accessed by local data entry/display units, card readers, printers, and typewriters.

Control Data personnel are currently conducting training courses to LSSC and depot programmers, analysts, and technicians to acquaint them with the 3300 system, Master operating system, Compass, USASI Cobol, and other CDC computer languages and hardware components.

the computer industry's first

key-to-disc

data input system

accepts the output from 60 or more key stations simultaneously

Time-shared input cuts data preparation costs 50%.

Now you can cut your computer input costs in half. This new innovation in data preparation techniques gives you two money-saving advantages over conventional keypunch or one-keyboard/one-magnetic-tape-per-operator systems: (1) the LC-720 employs a computer time-shared input; (2) it is the only system available that provides data output directly on IBM/360-compatible magnetic disc.

By time-sharing the data from 60 or more keyboard operators simultaneously, significant savings in data station costs of as much as 50% can be achieved. Costs drop to as low as $4300 per data station for a typical 60 station system. For large data preparation installations, the time-shared input is the only economical way to go.

Data entered into the LC-720 is processed by a small digital computer and stored on an IBM/360-compatible magnetic disc that provides the advantages of bulk storage and high speed random access of data. The problems associated with punched card handling or the mounting, pooling, merging and unmounting of magnetic tape reels are eliminated. All data is conveniently and economically stored in an IBM 1316 disc pack for direct high speed input to your modern data processing system. Naturally, an IBM/360-compatible magnetic tape is also provided with the system as standard equipment.

The LC-720 KeyDisc System also offers for the first time, data verification requiring one input pass only through the system, in addition to the normal technique of verification requiring two different operators. Record size is infinitely variable by each operator from 1 to 120 characters long and the system stores a large library of 30 or more different format control programs, all available simultaneously to any and all operators.

LC-720 KeyDisc System

Bring your own data for a demonstration

Logic Corporation invites you to see an operating demonstration of the LC-720 KeyDisc System at the company's premises. Bring your own original data and Logic will provide a reel of magnetic tape of the output of your data from the LC-720 for later printout at your own computer facility.

To arrange for a demonstration, contact Gary Tischler, Director of Marketing (201) 334-3713

LOGIC CORPORATION

15 E. Euclid Ave., Haddonfield, N.J. 08033 (609) 428-4626

COMPUTER FOR SALE OR LEASE

1401 C6-16K w/4-729 md. 2 drives
1401 E6 w/2 1311 disk drives & 4-7330 tape drives. 1401 C3-4K

1401 COMPUTERS WANTED

1401 Systems wanted now; or will purchase now & lease back until you want to release your 1401 System.

360-30 FOR LEASE OR PURCHASE

Will lease 360-30 at discount for lease time of 2 years. Will purchase I.O. equip.

SPECIAL ITEMS FOR SALE W/IBM M/A

1406 mdl. 01 (sn10696-A2)
(5) 729 mdl. 05 tape drives
(4) 7330 tape drives
2311 disk drives
Certified IBM 1316 disk packs with warranty

UNIT RECORD EQUIP. FOR SALE W/IBM M/A

026, 029 Keypunches
082, 083, 084, 085, 088
402, 403, 407, 514, 519, 552, 602

IBM RECORD WANTED

NEEDED IMMEDIATELY, keypunches, verifiers collators, sorters, reproducers and interpreters with or without IBM M/A

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Branch Offices: 318 W. 28th St., Los Angeles Calif.
(213) 747-0587
7790 N.W. 7th Ave., Miami, Fla.
(305) 693-3911

Earnings Reports

ADAMS-MILLIS CORP.
6 Months Ended June 30

	1969	a1968
Shr Ernd	$.44	$.44
Revenue	19,636,269	16,051,401
Earnings	792,629	790,855

a-Restated to include operations of Texelastic Corp., acquired in November, 1968.

INFORMATION DISPLAYS
6 Months Ended June 30

	1969	1968
Shr Ernd	$.11	
Revenue	935,390	$576,954
Earnings (Loss)	71,850	(4,612)

SANGAMO ELECTRIC CO.
6 Months Ended June 29

	1969	1968
Shr Ernd	$.27	$.46
Revenue	36,963,000	36,089,000
Earnings	744,000	1,242,000

REYNOLDS & REYNOLDS CO.
9 Months Ended June 30

	1969	1968
Shr Ernd	$.75	$.75
Revenue	31,556,085	27,132,014
Earnings	1,691,290	1,687,700

MEMOREX CORP.
6 Months Ended June 30

	1969	1968
Shr Ernd	$.83	$.56
Revenue	35,703,000	25,498,000
Earnings	3,073,000	2,016,000

COMPUTER INDUSTRIES, INC.
6 Months Ended June 30

	a1969	1968
Shr Ernd	$.18	$.11
Revenue	7,339,000	5,084,000
Earnings	700,000	379,000

a-Reflects acquisition of Datel Corp. on March 25.

BALTIMORE BUSINESS FORMS
3Months Ended June 30

	1969	1968
Shr Ernd	$.21	$.16
Revenue	4,376,552	3,703,254
Earnings	156,602	114,602
6 Mos. Shr Ernd	.51	
Revenue	8,941,550	7,664,767
Earnings	376,500	268,057

COMPUTER INVESTORS GROUP, INC.
Year Ended March 31

	1969	1968
aShr Ernd	$.30	$.27
Revenue	4,734,310	1,704,879
Earnings	539,261	307,461

a — Adjusted to reflect conversion of warrants for 760,000 shares.

3 Months Ended June 30

	1969	1968
Shr Ernd	$.10	$.06
Revenue	1,580,909	831,236
Earnings	185,461	108,618

GREAT WEST SADDLERY LIMITED
6 Months Ended April 30

	1969	a1968
bShr Ernd	$.08	
Revenue	13,500,000	
Earnings	508,000	

a — Comparable half-year results not available; b — Income before taxes indefinitely deferred amounted to 14.3 cents a share for the period.

DATA ARCHITECTS, INC.
6 Months Ended May 31

	1969	a1968
Shr Ernd	$.05	
Revenue	1,263,000	
Earnings	48,000	

a — No comparable figures.

HAZELTINE CORP.
3 Months Ended June 30

	1969	1968
Shr Ernd	$.32	$.22
Revenue	16,746,000	15,367,000
Earnings	626,000	422,000
a6 Months Shr Ernd	.59	.40
Revenue	31,094,000	27,999,000
Earnings	1,148,000	774,000

a — Included in the six-month share earnings are 9 cents in 1969 and 6 cents in 1968, attributable to the activities of Hazeltine Research, Inc.

TELEX CORP.
3 Months Ended June 30

	1969	1968
aShr Ernd	$.38	$.11
Revenue	9,459,101	6,065,141
Earnings	771,074	195,347

a — Fully diluted.

CYBERNETICS INTERNATIONAL
6 Months Ended March 31

	1969	1968
Shr Ernd	$.09	$.01
Revenue	866,953	259,410
Earnings	119,724	10,713

CYBERMATICS, INC.
3 Months Ended June 30

	1969	a1968
Shr Ernd (Loss)	$.05	($.03)
Revenue	246,011	34,810
Earnings (Loss)	33,715	(8,964)

a — Period from April 8, 1968, to June 30, 1968.

INTERNATIONAL TIMESHARING CORP.
Year Ended May 31

	1969	1968
Loss Per Shr	$1.44	$.64
Revenue	435,055	3,159
Loss	1,262,548	296,343

COMPUTER DATA SYSTEMS, INC.
Year Ended July 31

	1969	a1968
Loss Per Shr	$.35	
Revenue	281,937	
Loss	127,651	

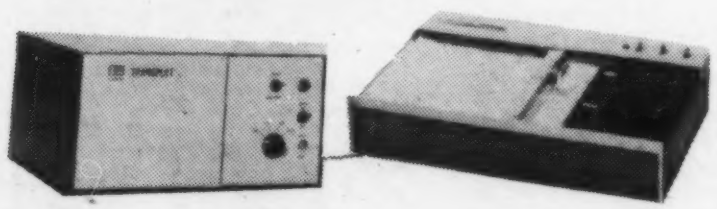
a — No comparable figures as this report is for its first year of operations.

TRACOR, INC.
3 Months Ended June 30

	1969	a1968
Shr Ernd	$.36	$.40
Revenue	21,288,000	21,447,000
Earnings	736,000	807,000
6 Months Shr Ernd	.60	.76
Revenue	42,365,000	41,734,000
Earnings	1,241,000	1,548,000

a—Restated on a pooling-of-interests basis to include operations of Mel-Rain Corp. and Comel International, acquired in April, 1969.

TRANSPLOT™



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TRANSPLOT™ Controller, as seen at WESCON, converts digital data for graphic presentation on analog plotters or CRTs. No computer or software is required although the TRANSPLOT can be operated by any time-sharing terminal, small computer or teleprinter without any added interfacing electronics.

Choice of decimal or binary input models. ASCII, EBCDIC, Baudot or E.I.A. code, or special parallel modes for off-line plotting from paper tape, magnetic tape.

Lines, line segments, points and discontinuous functions can be traced from a digital source by X-Y or Y-T recorders. Used to draft drilling drawings, P.C. layouts, machined parts, statistical charts, experimental models, real-time paths. Resolution of 2000 points in either axis, speed limited by recorder.

Other I/O SYSTEMS Products: Tape Preparation Units, Data Terminal Consoles, Data Code Converter Subsystems, Digital Instruments.

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360's FOR SALE AND WANTED

IPS has for sale the following 360 equipment for immediate delivery: 360/30 65K and 16K CPU's, complete 360/30 65K system, 2404 and 2402 tapes, 2841 and 2311's. Two 360/30 65K CPU's for Sept., 1969 and Jan., 1970 delivery; 2401-3 90KB tapes for December delivery. We are looking for 360/65 CPU or system, 360/50 CPU, 360/40 131K CPU, and any peripheral units for delivery in next few months. If you own such equipment and are upgrading, please let us know. For details and prices on equipment, please call or write.

IPS (201) 871-4200
INFORMATION PROCESSING SYSTEMS, INC.
467 SYLVAN AVENUE, ENGLEWOOD CLIFFS, NEW JERSEY 07632

Qantel's First Product to Be Small Multiuse System

HAYWARD, Calif. – A computer, practically small enough to slip into a suitcase, powerful enough to handle many business applications, and less expensive than a high-performance sports car, will be the first product offered by Qantel Corp.

Qantel was formed by four senior Friden executives to develop, manufacture, and market business-oriented computing and communications equipment.

Qantel V, combining a free-standing business computer and a terminal, is scheduled for delivery by the end of the year.

The Qantel V has a 4K memory and brings available technology, such as integrated circuits and MOS read-only memory, into the small accounting center, the plant, and the marketing manager's office.

The Qantel V is really five business machines and a computer, according to the company.

It's a digital computer tied into a terminal, a concentrator, a letter-typing system, an accounting/billing machine, and a secretarial station.

With a basic system cost of $11,250, the company also offers the computer alone to OEM for $4,000 with delivery in six weeks.

President Stanley Mantell was associated with the Friden division of the Singer Co. since 1965 as vice-president-operations and vice-president-manufacturing. Prior to this, he was general manager, Royal McBee Netherland, division of Litton Industries.

Dan A. Neilson, vice-president of product development, is credited with the development of nine computer systems for various companies.

At Friden, he was corporate director of advanced systems and manager for the business data processing program. He has held equivalent positions with RCA and Burroughs.

New Companies

Inc., with initial efforts to be the development and manufacture of computer peripheral equipment utilizing HDDR, a high-density data recording technique.

Clifford G. Zimmer Jr. was named president of the new company. Zimmer was formerly a vice-president with The Diebold Group.

"HDDR, developed at our Leach controls division," said K.F. Julin, president of Subscription Television, "has been applied most successfully to the company's aerospace magnetic tape recorders. However, this new patented technique for substantially increasing the packing density of data has unlimited potential in commercial computer applications. Subscription Television, Inc., with the formation of Ardis, intends to maximize that potential."

Zimmer, the new president of Ardis, has been active in the computer industry for the past 13 years. A graduate of West Point and the University of Tulsa (M.S. in engineering), he joined Univac in 1956, becoming New York regional manager. In 1967 he joined The Diebold Group and directed their national consulting staff in the application of computing systems to the management of organizations.

T/S Supplies, Accessories Offered for Sale

GLEN ELLYN, Ill. – Remote Computing Services has established a new business to serve computer time-sharing users with a complete offering of terminal supplies and accessories.

The firm is established at 799 Roosevelt Road here. RCS also provides consulting and software services to commercial time-sharing vendors and users, as well as in-house time-sharing systems.

A large collection of supplies and convenience accessories is now being marketed to the time-sharing community by RCS. The entire product offering is included in a catalog being distributed by the company.

Gal Opens Keypunch Firm

SAN FRANCISCO – Joining the growing list of feminine presidents of business firms in the San Francisco Bay area is Millie Hinchy, who recently opened the Millie Merritt Keypunch Service here.

Mrs. Hinchy's firm is presently in the process of installing 50 of the latest IBM machines, which will work on a two-shift basis providing keypunch service for accounts ranging from the smallest retail establishments to large corporations. The service is located at One California St. and is affiliated with Computerminal, Inc.

A native of Ohio, Mrs. Hinchy has an extensive background in data processing. She worked with Statistical Tabulating Corp. for eight years as assistant keypunch supervisor and then as full supervisor in charge of keypunch estimating, scheduling, and hiring of personnel. Prior to opening her new business, she was keypunch manager for Recording & Statistical Corp.

Subscription Television, Inc. Moves Into EDP Industry

SOUTH PASADENA, Calif. – Subscription Television, Inc. has formed a new subsidiary, Ardis,

how to slash $30,000 per month from your computer overhead

DatagraphiX systems save a fortune in machine rentals, staff time, computer time, print time, 87% less paper/carbon consumables, 99% less storage. Compared to impact printing, DatagraphiX output is roughly 27 times faster, takes 1/18th the computer time, cuts 7/8ths of your supplies cost. If you do multi-part printing in any volume, your paper consumption alone can run into 6 figures. One user switched to DatagraphiX Micromation after discovering the purchase price of his paper had exceeded $300,000 for one year.

Micromation also provides multiple economies in retention and retrieval. Translating computed data into report formats and shrinking storage requirements to 1/525th. Offering access to thousands of facts within a matter of seconds from screen display inquiry stations. Instant replay of the facts in time to effect better decisions, improved profits. Hard copies on demand.

For high volume production printing, paper copies can be produced from data film at 5,200 pages per hour. That means you could turn out 20,000 bank statements in a lunch hour. Or thousands of direct mail pieces on preprinted, multi-color forms.

Only one company offers the complete family of machine systems; service centers; Kalvar dry film processing; all associated supplies; systems and software support; worldwide maintenance. Discover what Micromation can do for you. Contact our local office or National Sales Manager, James P. Whitfield.

DatagraphiX micromation systems

Stromberg DatagraphiX Inc., a General Dynamics subsidiary, P.O. Box 2449, San Diego, California 92112 (714) 283-1038 TWX: (910) 335-2058

First Dual Al-10 Activated in Al/Com's T/S Network

PRINCETON, N.J. – The first section of a large computer center to serve scientists, industrial managers, businessmen, engineers, and bankers was completed this week at Mathematics Park, Princeton, where Applied Logic Corp.'s Al/Com computer time-sharing network activated the first of 20 Dual AL-10 computer systems scheduled to be installed at this site by 1971.

The new Mathematics Park computer joined two other systems located elsewhere in Princeton that launched Al/Com time-sharing service three years ago.

According to Richard M. Colgate, Applied Logic's chairman, this marks the beginning of Al/Com's bid for prominence in the burgeoning field of computer time-sharing.

Also to be tested in the extremely competitive time-sharing marketplace is the centralized dual-computer concept pioneered by Al/Com. In this system, pairs of matched computers in banks are interlinked to form a nucleus of computer power for a national network of users.

Capable of serving up to 50 users simultaneously, a Dual AL-10 consists of two DEC PDP-10 central processing units, a massive core memory, and secondary data memories comprised of drum, disk, and tape units, augmented by several satellite computers and specially designed interface equipment.

The combined billion-character memory of an AL-10, its microsecond cycle time, and comprehensive programming with instructions, languages, and mathematical-scientific subroutines give the computer bank the capacity, versatility, and speed to compute the most difficult and extensive programs, according to the company.

Expansions

Each PDP-10 in a Dual AL-10 system backs up its mate and assumes its work load should there be a malfunction. And each AL-10 system backs up the next to assure reliability of time-sharing service.

Unlike most other time-sharing services, which situate computers in regions to serve local customers, the Al/Com system centers all its computer banks at Princeton and serves users throughout the country.

When an Al/Com customer in California, for instance, dials the computer on his telephone, his call travels over local lines to an Al/Com remote computer in a major city.

This equipment performs a message switching and multiplexing function, sending the call over an economical, leased, single-telephone line to the Princeton computer hub.

Other Recent Moves

Information Science Industries Ltd., a wholly owned subsidiary of Information Industries, Inc. of Wayne, Pa., has opened a new data processing service bureau at Ottawa, Canada.

Computer Response Corp.'s Pittsburgh branch office has moved to the Penn Center Complex at 500 Penn Center Blvd. The company offers time-sharing on a large-scale computer through data communications terminals, computer facilities management, computer program application development, and data systems management consulting.

National Systems Planning, Inc. of Atlanta, a data processing consulting firm and producer of packaged computer systems, is moving to 3098 Piedmont Road.

CCC Computer Corp. has established a Houston division office at 3100 Richmond St. CCC provides accounting services, financial and management reports, and the automatic preparation of U.S. individual income tax returns.

Information Systems Management of Richland, Wash., has signed a lease for additional space in the 1201 Jadwin Bldg. to be utilized as an operations center for the design and development of software systems. The firm specializes in the development of data management systems for computer users.

Computer Retrieval Systems, Inc. of Bethesda, Md., has consolidated its executive offices, information services, marketing activities, and systems development programs at 4900 Auburn Ave. Computer operations remain at 4905 Del Ray Ave.

Financial Planning Computer Corp., a Dallas-based firm specializing in the development and administration of computerized pension and profit-sharing plans, has opened offices on the second floor of the Long Memorial Bldg., 9000 Harry Hines Blvd.

General Automation, Inc. of Orange, Calif., has opened a sales and service office at 251 W. DeKalb Pike, Suite EG4, King of Prussia, Pa. General Automation is involved in computer-based automation solutions.

Electronic Accounting Corp. of Encino, Calif., wholly owned subsidiary of Automated Services, Inc., has opened its third data processing training school at 2140 W. Olympic Blvd., Los Angeles. The 3,000-sq-ft facility will house leased training equipment used in its courses, which range from keypunch instruction through programming.

Digital Equipment Corp. has moved its European headquarters from its manufacturing plant at Reading, England, to Geneva, Switzerland.

Computer Response Corp. has opened a branch office at 1514 Fifth Ave., N.E., Knoxville, Tenn. Computer Response offers time-sharing on large-scale computers through data communications terminals, computer facilities management, computer program application development, and data processing system consulting.

The Washington regional office of McDonnell Automation Co. has relocated at 2990 Telestar Court, Fairfax County, Va. The office performs data processing, programming, and computer consulting.

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Las Vegas, Nov. 18, 19, 20.

Over 337 Computer Industry companies will be exhibiting . . . The most ever (twice as many as Spring Joint).

Your prospective customers won't get lost in the crowd if you advertise in these Computerworld Fall Joint Special Issues.

● Computerworld FJCC Preview Issue
Issue Date – Nov. 12, 1969
Adv. Closing Date – Oct. 31, 1969
This issue will be read a week before the Joint opens.

● Computerworld FJCC Show Issue
Issue Date – Nov. 19, 1969
Adv. Closing Date – Nov. 7, 1969
This issue will be read at the Joint.

COMPUTERWORLD will distribute 7,000 copies of each issue to FJCC attendees.

AND . . . an even better idea is not to wait until the last minute. Make this your biggest Joint too by taking advantage of Computerworld's weekly issues BEFORE FJCC.

For your convenience we've listed below our Issue Dates and Closing Dates from September through FJCC.

So that you don't get lost in the crowd in November, we recommend you use as many of these pre-show issues as you can.

Issue Date	Adv. Closing Date
Sept. 17	Sept. 5
Sept. 24	Sept. 12
Oct. 1	Sept. 19
Oct. 8	Sept. 26
Oct. 15	Oct. 3
Oct. 22	Oct. 10
Oct. 29	Oct. 17
Nov. 5	Oct. 24
Nov. 12	
FJCC Preview	**Oct. 31, 1969**
Nov. 19	
FJCC Show	**Nov. 7, 1969**

For further information contact your nearest Computerworld sales office or call Neal Wilder, Computerworld (617) 332-5606.

New Registrations

HYBRID COMPUTING SYSTEMS, INC., 80 Second St. Pike, Southampton, Pa. 18966, a company that designs, manufactures, and sells small, special-purpose, combination analog and digital computing instruments that measure and/or regulate the dynamic performance of control systems and component parts of systems used in industrial, aerospace, and military fields, filed to register 125,000 shares of common stock. Proceeds, at $8 per share, intended to purchase and improve property that will be its executive and manufacturing facility, to purchase equipment, to finance advertising and promotion, to establish sales and service offices, and to develop and/or complete frequency-response analyzers, vibration analyzers, and process controllers. The underwriter is Weinberg, Ost & Hayton, Inc., 52 Broadway, New York, N.Y. 10004.

NATIONAL INFORMATION SYSTEMS CORP., 150 Allendale Road, Valley Forge, Pa. 19481, a company that provides information services requiring the use of computers and other data processing equipment and components, filed to register 202,779 shares of common stock. Proceeds, at $6 per share, intended to purchase or lease large-scale computer systems to support the company's entry into the remote facility management field and to purchase, convert, and implement industry general-purpose information packages and systems. No underwriter is involved.

DELOS INTERNATIONAL GROUP, INC., 100 State St., Boston, Mass. 02109, a company that purchases computer equipment for lease to others and is engaged in time-sharing in England, filed to register 400,000 shares of common stock. Proceeds, at $12.50 per share maximum, intended for retirement of a short-term bank note, for the purchase of additional time-sharing computer equipment, and for the purchase of computer equipment for leasing activities in the U.S. The underwriters are Dempsey-Tegeler & Co., Inc., 1000 Locust St., St. Louis, Mo. 63101 and Legg & Co., 22 Light St., Baltimore, Md. 21203.

COMPUTER INVESTORS GROUP, INC., Symphonette Sq., Larchmont, N.Y. 10538, filed to register 448,598 shares of common stock. These shares are issuable upon conversion of 5-3/4% guaranteed (subordinated) convertible debentures, due 1988, of CIG International Capital Corp., a wholly owned subsidiary of the company.

REMOTE COMPUTING CORP., One Wilshire Bldg., 624 S. Grand Ave., Los Angeles, Calif. 90017, a company that provides computer utility services to customers that are remote from the company's computer centers or that bring their work to these centers for on-site processing, filed to register 250,000 shares of Class A common stock. Proceeds, at $12.50 per share maximum, intended to open and operate five additional computer centers and to develop computer software programs for business data processing time-sharing. The underwriter is First California Co., Inc., 300 Montgomery St., San Francisco, Calif. 94104.

COMPUTER COUNSELING, INC., 30 S. Calvert St., Baltimore, Md. 21202, a company that develops a service to match by computer the qualifications and preferences of prospective college applicants with the respective curriculums and requirements of colleges and universities, filed to register 200,000 shares of common stock. Proceeds, at $5.75 per share maximum, intended to pay six-month notes, obligations incurred by an acquisition, the temporary mortgage on the company's office building, and to finance research and development. No underwriter is involved.

TABULATING STOCK FORMS, INC., 304 W. 23rd St., New York, N.Y., a company that manufactures and sells continuous business forms for use on EDP and tabulating equipment, filed to register 162,000 shares of common stock, of which 132,000 are to be offered for public sale by the company and 30,000 (being outstanding shares) by the selling stockholder (George J. Barney). Proceeds, at $5 per share, intended to purchase equipment and to modify an existing continuous-forms collator. The underwriter is A.J. Carno Co., Inc. 42 Broadway, New York, N.Y. 10004.

DATAMEDIA COMPUTER SERVICE, INC., 2128 Republic Bank Tower, Dallas, Texas, a company that produces a data recording device used to record voting in elections, filed to register 200,000 shares of common stock, of which 180,000 are to be offered for public sale by the company and 20,000 (being outstanding shares) by the present holder thereof. Proceeds intended for salaries, research and development, and inventory. The underwriter is McKinney, Rose & Co., Inc., 2200 Mercantile Bank Bldg., Dallas, Texas.

COMPUTER METRONICS, INC., 1559 Ferndale Ave., Johnstown, Pa. 15905, a company that fabricates cabinets, frames, and related items for electronic and computer equipment, filed to register 325,000 shares of common stock. Proceeds, at $1 per share, intended for general corporate purposes. The underwriter is Max Zerkin & Associates, Inc., The Professional Bldg., 7942 Wisconsin Ave., Bethesda, Md. 20014.

Acquisitions

The acquisition of **DCA Reliability Laboratory** of Mountain View, Calif., by **Computer Time-Sharing Corp.** of Palo Alto, Calif., has been completed through a transfer of an undisclosed amount of CTC common stock. DCA is engaged in reliability consultation and establishment of specifications as well as reliability screening of electronic components.

DPA, Inc. of Dallas has completed the acquisition of **Burton, Inc.**, operator of Burton Shipyards, Port Arthur, Texas. Under the terms of the purchase agreement, DPA paid the selling Burton shareholders $5 million in cash at closing, with a $4.5 million cash installment due Jan. 2, 1970. DPA leases data processing equipment. Through subsidiaries it also sells motor fuel-oil conditioners, oils, and greases and manufactures protective textbook covers.

Multidata, Inc. a Westminster, Calif., software and marketing firm, has merged with **Digital Techniques Laboratory**, Denver, Colo., a computer communications and special computer system company. The merger is contingent upon approval of the shareholders of both companies. Digital Techniques will operate as a wholly owned subsidiary of Multidata, Inc.

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Now you can have a complete photographic processing laboratory attached to your computer.

Series 1200 Processors interface directly with any existing data recording camera, to give you high resolution, optimally processed film — 16mm, 35mm, or 105mm — at output rates as fast as 70 inches per minute.

The processed film is near-archival in quality and can be fed immediately to a projection/hard copy station, an on-line reader, or other peripheral device, as fast as it's processed.

Operation is simple. All you do is straight-line thread the film from the camera through the processor. The rest is automatic. You can process 2400 feet of film before replacing chemicals.

In addition, the processor is small enough to fit in your existing computer frame—in space that you're probably not now using. And the chemical supply can be located away from the processor, with no loss in performance.

Best of all, the Series 1200 uses a processing method that has been proven over many years, in numerous airborne and land-based recording applications. It produces uniform processing quality over the entire length and width of the film.

Series 1200 processors are available now. For the full story and/or a recommendation tailored to your individual requirements, call or write Mark Systems, Inc., 10950 North Tantau Avenue, Cupertino, California, 95014
(408) 253-8300

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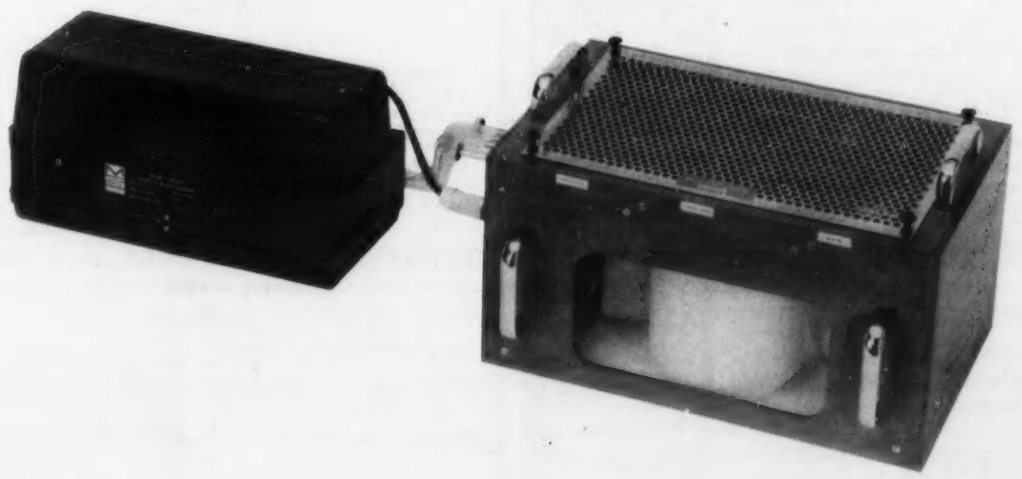

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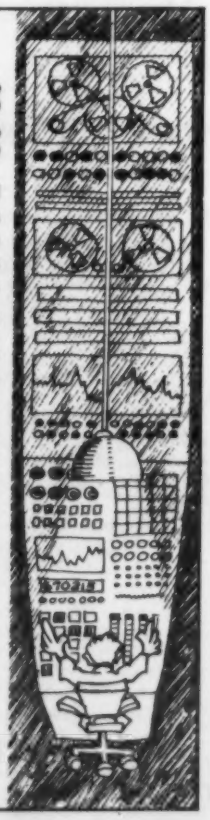

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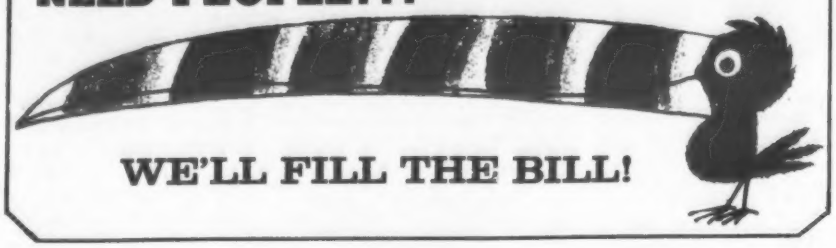

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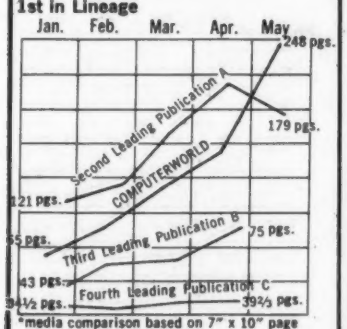

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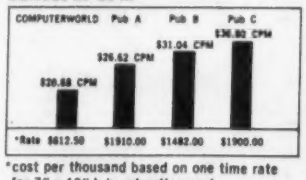

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